This is a draft of Chapter 7 in the book outline

Public Psychology in the Resource-Patterns Model of Life

by Richard Ober Hammer, November 2021

0. Introduction

Our subject in this Chapter grows from the postulates of the Resource-Patterns Model of Life (RPM). Those postulates create settings in which groups of Living Things (LTs) can live better if the individuals in those groups adopt particular Behavior Patterns (BPs), BPs which turn out to be beneficial for the group as a whole. But how, we ask, can those BPs be discovered? This is the challenge of public psychology, the subject of this chapter.

As a starting point for our Thought Experiments (TEs) we use a particular species of LTs, Tabletop Critters. A reader who is not already familiar with the model of Tabletop Critters would do well to learn that model as it is expressed in Chapter 2, Section 2.2.

0.1 Overview of the circumstances which give rise to public psychology

We postulate that the environment surrounding our LTs contains Resource Patterns (RPs) on two levels. For the first level where we start our TEs the environment contains resources distributed in such a way that our individual LTs can survive, albeit meagerly, by making choices which are not coordinated in any way with the choices of other individuals. That is how we envision our initial condition — with a population surviving meagerly as hunter gatherers.

Then for the second level we add a larger RP. This larger RP, we stipulate, cannot be accessed by individual LTs in our model because this larger RP is difficult to access. But we do arrange our model so that a group of LTs could succeed in exploiting this larger RP — if and only if the individuals comprising the group adopt appropriate BPs. These individual-level BPs must be coordinated, that is they must combine in such a way that the group all together can harvest from the larger RP. If the group succeeds in harvesting from the larger RP then all the members of the group can live better.

As we human modelers lay out challenges for the LTs in our TEs, we simultaneously challenge ourselves to grasp how the LTs can achieve the required coordination. We will sometimes call the LTs “agents” and consider them to be operating in the settings which we call Agent-Based Models (ABMs). These agents need to acquire new BPs. And these new BPs require that the agents acquire new information-processing capabilities. Such information-processing capabilities will initially include signaling and sensing at a distance. But as our species of agents becomes more sophisticated, we modelers will recognize that our agents need capabilities which include: language, recognition of leaders, submission to group rules, challenging group rules, and many other human-like traits.

0.2 Relationships between our terms: rules, BPs, RPs, and LTs

Here I will review how our model's central terms relate to one another. I frequently used the term "rules" in my early writing about RPM. Rules are guides to decision making. Rules are considered by an individual LT when that LT is deciding which act to attempt in a given setting at a given moment. Such a rule might be: If you are in danger of running out of water, head toward the location where you last found some water.

Rules have a strong relation with Behavior Patterns, a concept which dawned in my thinking only last year. A BP comes into view (the view of some overseer) in situations after rules have guided behavior through a sufficient span of time. BPs emerge then, as a consequence of rules.

Both rules and BPs relate to RPs, because in order to survive all LTs need to imbibe resources from the environment. LTs can imbibe resources by discovering rules which lead to BPs which succeed in exploiting RPs.

Even though we think in terms of rules which direct behavioral choices at a low level, you should not think that RPM is therefore deterministic — because one of the rules which LTs must discover is to choose an act before too much time has passed. Reality presents some circumstances is which any act, even an act chosen randomly, is better than to waste more time.

0.3 Public Psychology correlates with Life in Levels

When we succeed in our thought experiments, by showing how individuals can work together to accomplish exploitations that none of them alone could have accomplished, our assumption that life grows in levels (See Chapter 4) is bolstered. Each such success may be regarded as a single step toward eventual development of a new LT on a higher level. But a higher-level LT must have all the capabilities which are possessed by LTs as we have postulated in Chapter 1, Section 1.4.2. As such a higher-level LT could be formed only after taking many of the single steps such as we will consider in our thought experiments here. So these single steps of increased organization only begin a journey that may extend thousands of such steps before the organization being augmented has all the capabilities that would lead us to categorize it as a LT.

So there is a continuum of amount of organization. We start in the initial condition with a population of LTs which are not acting together in any coordinated way, that is we start with LTs which are not organized. Then we see how LTs which cooperate in small ways can live better, but we may be reluctant to call a set of such minimally-cooperating LTs an "organization". But as more ways of cooperating help a set of LTs to become more successfully organized in exploiting the RPs in their environment, the set begins to look to us like what we willingly call an organization. I will use various terms (group, organization, living system, decision-making entity) to label sets of LTs which are cooperating but which still fall short of a degree of organization which we would recognize as a LT on the next higher level.

0.4 Objects in view: considering what we see

We human modelers should be aware that the subject of this chapter has two aspects.

Outward view of public psychology: When we humans identify with the critters in the settings which we create for them then we can gain insight into our human group dynamics. This public psychology will be the main object of our attention here.

Inward view of nervous system organization: But, once again being aware of life-in-levels, we humans consider our individual selves to be ornately organized groups of billions of cells. The plan for our bodies, I suppose, was somehow developed through long biological history by cellular-level entities which faced their own challenges of public psychology. As such, we may consider the public-psychology subject of this chapter as an exploration into:

1. the signaling between and among our cells, and
2. the means and limitations of the information-processing capabilities which comprise our nervous systems.

0.5 Viewpoints: considering who or what is seeing

In this text I shift around from viewpoint to viewpoint, discussing what can be seen from different stances. We human modelers, for example, often consider what a critter can see, know, or think. That is, from our point of view we discuss the critter's point of view. This disentanglement may be easy enough to manage, with frequent reminders. But we also need to separate various human stances. For instance we need to separate we-human-modelers from we-humans, because we-human-modelers speak in a model-specific terminology which remains generally unknown among we-humans. I, the author, while drafting this material have often needed to pause to clarify my own thinking about what point of view I am representing. So I ask you the reader to join me in vigilance for clarity on what point of view we may be representing as we think or express ourselves. A habit of clarity about viewpoint can help us not only in RPM but also in our everyday conversations.

0.6 About the organization of this chapter

The thought experiments in this chapter lead to a number of conclusions, conclusions which I have decided to label as Lessons. As such, "Lesson:" is the first word in many of the subsection headings which follow.

All the lessons must be presented in some sequential order, so I sought a coherent scheme of ordering. I noticed that each lesson arises from consideration of one of the "Challenges for our Critters" presented in Chapter 2 Section 4. Three of those Chapter 2 challenges stimulate all of the lessons here, so I decided to group the lessons into three corresponding sections:

- Section 1 addresses the first challenge as depicted in Figure 1. Critters of the initial condition are challenged to achieve a first level of organization;

- Section 2 addresses the second challenge as depicted in Figure 7. Critters, having mastered the first challenge, are challenged again with a different and larger pattern.
- Section 3 offers the third challenge as depicted in Figure 10. Critters face a yet larger challenge.

This grouping, although offering structure, has not produced sections of equal length. The first section is far the largest. And when at last we reach the third section, I conclude the chapter with mere presentation of that challenge.

In addition to the Lessons which follow, the reader will find subsections labeled “Digression:”. In these digressions I step aside to make sure the reader understands the process of modeling which we are employing.

1. What we learn from our first challenge, in Figure 1

We take up the lessons and digressions which arise from the challenge depicted in Figure 1.

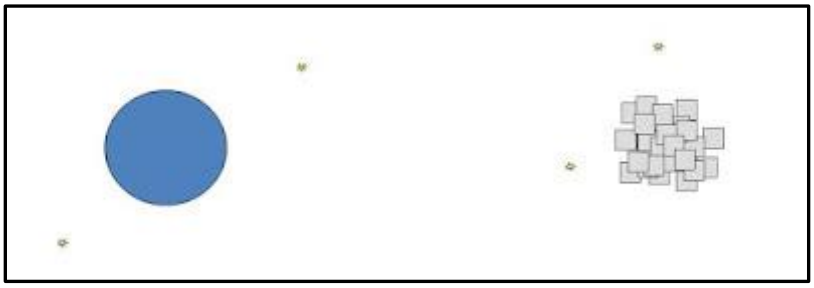

Figure 1. The initial condition is changed by addition of a huge new RP.

1.1 First lessons

In this first subsection of Section 1, we will go through lessons and digressions which arise naturally at first, before we take on the complicating factor of antisocial behavior. Antisocial behavior will be considered later in subsection 1.2.

1.1.1 Lesson: A Population can live in greater density

In the initial condition of the Tabletop Critters model, a given area could support only a thinly scattered population and that population survived only by continual foraging for water and sugar. But then we modelers introduced a huge new Resource Pattern (massive deposits of water and sugar) as shown in Figure 1. Then in Figure 2, depicting how we expect the critters’ world to look after passage of sufficient time, we see a cluster of dense critter population between water

and sugar. This dense cluster came about because we modelers gave the critters not only the large RP but also extra capabilities which enable their cooperation to exploit the large RP.

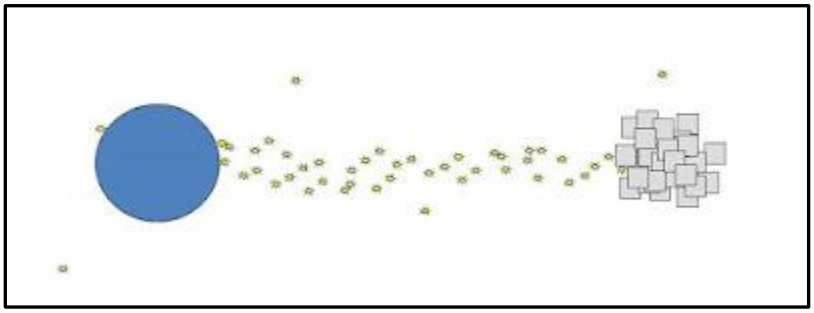

Figure 2. Critters have formed a dense and prosperous cluster.

1.1.2 Digression: About the extra capabilities given to critters so they can succeed as in Figure 2.

To be clear about the extra capabilities given to critters, you may recall that in previous Chapters we have given two different sets of capabilities, each of which could enable cooperative exploitation of the new large RP. These two sets of capabilities are:

1. Directional rules-from-overseer: The first and simplest set of capabilities, given in Chapter 2 Section 2.2.2, included simple behavioral rules about the directions in which to carry the resources.
2. Trade rules: The second set of capabilities, given in Chapter 5 Section 2.2, included abilities to negotiate profitable trades with other critters and thus, with enough experience, to learn the directions is which trucking is most likely to be profitable.

In the coming sections of this Chapter we will usually assume the critters have been given trade rules, the second set of capabilities. But our lesson, that a population can live in greater density, stands with either of these sets of capabilities; we expect growth of a dense population with either set of rules.

1.1.3 Digression: Transition to same explanation for humans

While I have some confidence that you my reader readily agree with my explanation for the density of critter population in Figure 2, I have less confidence that you will concur with my assertion that similar lessons apply to human populations, because you will be aware that human environments and lives are so much more complex than those of critters. So now I will spend some paragraphs trying to convince you that humans in fact face similar constraints.

We know that the human population on Earth has increased greatly during recent millennia, and a substantial portion of us now live in densely populated urban areas. These same areas could not have supported even a small fraction of as many people per square mile long ago when our ancestors supported themselves as hunter-gatherers.

Requisite knowledge for humans much more complex
Of course the case of human cities differs from the case of critters in Figure 2, because the critters draw only two resources from their tabletop, whereas humans draw thousands of resources from the Earth. And the critters succeed with only a few rules whereas humans work in thousands of occupations with each occupation requiring knowledge of many rules. So our survival as humans in dense populations is orders of magnitude more complex than the survival of critters between the water and sugar.

Requisite knowledge of specific places
But, having acknowledged the vastly more complex circumstances of human populations compared with critter populations, notice this similarity: every single resource employed by humans exists – as it does for critters – in a particular place or places. Each resource is someplace, not everyplace, and knowledge of the place, known by one or more of us humans, is part of what makes it possible for all of us in densely-populated human communities to get the shares we may need of that resource.

Requisite knowledge of specific process, or rules
Another part of what makes it possible for us humans to live in cities is knowledge of the rules that must be followed. Rules must be followed to process resources (raw materials) to make products which city dwellers need. Rules must be followed to get those products into spots in the city accessible to city dwellers. So, as with the critters which cannot carry water and sugar in any directions which they fancy, we humans cannot act in any ways which suit our fancies. No, we must follow only those particular rules which can helpfully create and distribute the products needed in cities.

To summarize the point we have made: A relatively dense population of LTs, whether humans or critters, can live only if some or all of the population's members behave in patterns which productively combine the capabilities of individual LTs with physical facts of the environment.

1.1.4 Lesson: The model of critters shows some lessons distinctly, lessons which we might overlook when considering our more complex human populations.

In the preceding section I attempted to persuade you of a particular point (rule-following behavior enables a dense population) regarding two different population models, critters and humans. Now, with my attempt at persuasion fresh in your mind, we pause to compare the effectiveness of those two population models. Ask yourself: Are you convinced about the point for both populations? Or do you find the point more convincing for critters than for humans?

For me, the point seems self evident for the model of critters. But for humans the point is difficult to make. As humans, our production and consumption of products is multidimensional. With all this complexity a creative human mind trying to explain the density of a human

population can posit many explanations. So, while I maintain that the point is just as valid for complex human populations as it is for simple critter populations, you might join me in embracing the point for humans only if you focus as single-mindedly as I do on an essential relationship involving RPs and BPs, RPs and BPs which must be spotted amid a chaos of possibilities. For you to see the point as it applies to human populations, it may be necessary that both: you have learned to recognize the essential factors and; you are motivated to recognize those factors.

Now – assuming you do get that point for human communities – do you join me in appreciating the power of the model of critters? The critters model is simple but shows some physical constraints which undeniably must apply to any population of LTs, no matter how technologically sophisticated that population. With that belief in mind we will continue to use the model of critters as a tool for basic social science, expecting that we may discover lessons relevant for critters — which upon reflection must also be relevant for humans.

Of course we must be careful to consider whether a lesson, which seems clearly demonstrated within our critter model, can be extended to the human model. We need to develop and justify our reasons for believing that a critter-model lesson applies to the human model, in spite of the human model's greater complexity.

In the sections ahead we will refer as needed to both models, critter and human, and also occasionally to the more general model of LTs. We find use for all three population models (critters, humans, LTs) as we humans seek lessons applicable to ourselves.

1.1.5 Lesson: Rule-bound behavior probably correlates with either a real RP or an imagined RP.

I believe it is common for us humans to observe behavior by others which appears patterned, governed by rules that is, in cases where we see no reason for such rule-bound behavior. While the behavior may seem nonsensical to us, we should keep open minds about whether there is actually a reason, a RP, which we have not yet conceived. While this lesson applies first to situations where there is a real RP which remains outside of our conception, there is more. In later Sections we will develop justification for rule-bound behavior even in situations where the RP is only imagined (See Sections 1.3.1 and 2.10).

1.1.6 Lesson: Much of the population will die if productive BPs are disrupted.

Also notice this corollary: after a larger population has grown pursuant to rule-following behavior, such rule-following behavior is necessary to continue support of that larger population. If the population abandons following the rules most in the population will die.

1.1.7 Digression: About giving extra powers to the critters

As we advance in our modeling to social phenomena more complex than immediate physical survival, we will usually find that the critters as already specified for earlier TEs are insufficient, that our critters seem incapable of developing a social pattern which models a human pattern of

interest. So we will give the critters a few more powers, just enough we hope to produce results which remind us of communities of humans or other advanced LTs.

But we should list the specific powers given and not fall into the error of assuming that the critters have powers which we have not given them. Anthropomorphism can destroy the educational value of our modeling by short circuiting discovery of unexpected modes of community-wide cooperation. And we are especially vulnerable to anthropomorphism since we usually use Thought Experiment Agent Based Modeling (TEABM) as opposed to Computerized Agent Based Modeling (CABM).

For example, consider the critters in the situation of Figure 1. They have powers which enable them to survive in the initial condition, that is they are programmed to forage incessantly for those deposits of water and sugar which are too small to be seen in that view in Figure 1. But as we have designed the initial condition the critters are incapable of organizing themselves into a cooperative group which can flourish as we see in Figure 2. So we test by giving them extra powers which we expect may minimally enable them, given enough time and perhaps some luck, to discover the cooperative gain. But if we too blithely give the critters of Figure 1 human-like powers, if for example we assume that the critters can see with human vision across the tabletop to the distant resources, then we destroy the learning opportunity in the thought experiment.

After we have given new capabilities to individuals, we may be surprised at what happens in our models. This is especially true for CABM. A new BP displayed by a group of newly-gifted individuals may appear unrelated to the individual-level gifts — or at least the new BP may appear unrelated in our inexperienced human-modelers' conceptions. A relationship of cause and effect may become apparent only to those of us humans who have learned an explanatory mechanism, a story which tells how individuals used their gifts and thus created the group-wide effect.

1.1.8 Lesson: In the flourishing community requisite knowledge is distributed.

Now we notice in Figure 2 how knowledge is distributed among the critters. Throughout the whole cluster individual critters have a part of the knowledge which enables the cluster to exploit the RP, to live.

Distribution of that essential knowledge has these important consequences:

- Each critter in the whole cluster between water and sugar gets its life-essential needs satisfied because of the rule-following behavior of many other critters which occupy different positions in the cluster.
- If the distribution of knowledge falls short, that is if individual critters in the cluster do not have the knowledge (do not follow the rules), then the community-essential transport of both water and sugar will degrade in the immediate vicinity of those non-conforming critters. Furthermore, if enough neighboring critters in a slice across the cluster do not have the knowledge then water and sugar will not pass across that slice. The whole cluster will collapse into starvation and the population density will fall back to its level in the initial condition.

1.1.9 Lesson: No critter has oversight.

Notice that this prospering cluster does not have a Critter Headquarters which gives rise to the essential knowledge which makes life of the cluster possible. We know there is no Critter Headquarters because, reviewing the only powers which we have given to critters, we know that no critter can:

- see the large RP or sense it in any way,
- give instructions (rules) to another critter,
- understand how a community may grown.

1.1.10 Lesson: On the other hand we human modelers do have oversight with which we can comprehend what makes the critter cluster possible.

With the huge advantage in mental capacity which humans have over critters, it is conceivable to us humans that the economy of the prospering critter cluster could have been designed by an intelligent designer. In fact I, the author, take credit for that design.

1.1.11 Lesson: We see a contrast between created order and discovered order.

Remember that, prior to this Chapter, we used two different sets of rules which may be given to the critters so they can to meet the challenge of Figure 1. In Section 1.1.2 above we gave names to those two sets of rules, being (1) directional rules-from-overseer and (2) trade rules.

Now we understand that an overseer who perceives all the relevant circumstances can successfully give directional rules. We may recognize such an order as “created” by the overseer.

By contrast, suppose the critters have been given trade rules and then, after passage of enough time, fallen into the Figure 2 pattern of prosperity. This prosperity may be obtained even though no entity had oversight. No critter that is, but also no human or deity. We consider such order to be “discovered”.

Of course I knew that trade rules would be enough, given the other circumstances in the TE. The trade rules are a sort of low-level empowerment which give the possibility of discovery of successful BPs. Our hope in working with RPM is to learn as much as we can about such gifts of low-level empowerment, because such gifts may explain a great deal about our minds, perceptions, and biases.

On the other hand, we also see affirmation for the self confidence felt by an entity which possesses oversight. In life it is commonly true that success follows from directional rules.

1.1.12 Lesson: The BPs adopted by LTs (agents) may differ from LT to LT.

Our critter model as developed so far has suggested uniform sets of rules, in which each critter in the population is given the same set of rules. But uniform sets of rules are not necessary for critter success. More generally we expect different rules for critters in different situations. See Figure 3 in which we have added a barrier. The barrier complicates the challenge as we offered it in Figure 1, because now there is a situation between water and sugar in which critters should carry resources in directions opposite the norm needed elsewhere between water and sugar.

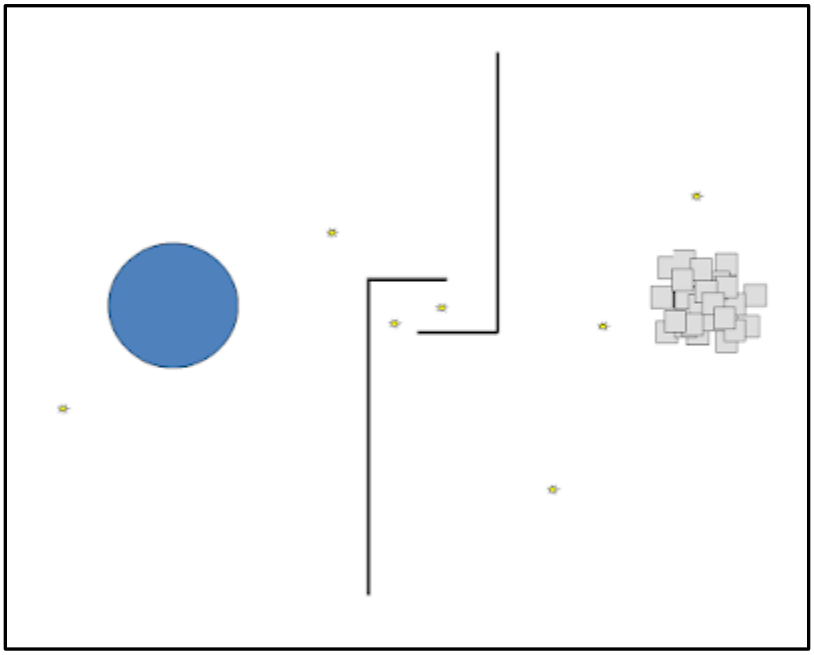

Figure 3. Showing how critters in some locations may require different directional rules.

Without inserting more Figures in this paper, I invite you to imagine that many more barriers might be added along the route between water and sugar, so that a thriving trade route could be established only if critters in each locality learned the requirements which are specific to their local circumstances. This example highlights an important difference between directional rules-from-overseer and trade rules. Directional rules-from-overseer cannot work in a challenge with numerous barriers along the way. But trade rules still work with many barriers in the way because each critter can learn what is needed in its locality.

1.1.13 Lesson: Life-essential resources are easy to find.

Imagine how easy it will be for the critters living in the prospering cluster of Figure 2 to find both water and sugar. By searching only short distances in directions which they know they will soon discover what they need. Compare that ease of life in the cluster with the hardship faced by critters in the initial condition in which they were hunter-gatherers. As hunter-gatherers they had to forage continuously in all directions seeking water and sugar, hoping they could avoid death for want of one of these resources.

For humans in one of our modern cities, suburbs, or towns, it is similarly easy to find sustenance. Food can be obtained in many stores or restaurants of which we are aware, typically these sources are nearby and easy to reach.

1.1.14 Lesson: Individual LTs may be ignorant of their own rule-following, RP-directed choices.

The fortunate critters in Figure 2 have no cognizance of their own rule-following behavior. As we have designed this TE the critters have no such mental ability. The important point here is that success in the expansion of life may be achieved without the awareness of the agents whose choices combine to make that success.

Humans who, by working in a job, follow the rules laid down by the employer, do not necessarily recognize that their tasks in the job contribute to the exploitation of what is (probably) a RP which lies beyond their perception. A job may seem menial, especially to a human with mental capacities not used in carrying out the job. The human may feel the job is below his dignity. But still the job may contribute to the economic success of a community by contributing to exploitation of a RP, while the RP and the community remain outside the worker's range of perception or recognition.

1.1.15 Lesson: Do not forget the necessity of the RP.

We have affirmed the value of knowledge, expressed as rule-following behavior, to the life and prosperity of a community of LTs. But we must not forget that this knowledge derives its usefulness from a RP which exists in the environment. Knowledge can be helpful for the LTs only if and to the extent that it relates to a fact (a RP) in the environment. The RP came first, and the knowledge later.

1.1.16 Lesson: Prospering LTs cannot freely change the rules which lead to their success.

For the critters in Figure 2, it should be painfully obvious to us human overseers that the rules (carry water right, sugar left) are not the critters' rules to make or change.

Similarly for humans, the rules which we need to obey in order to participate in the economic success of a community of humans are not for the most part created by humans. The rules fall out of physical facts which are beyond the power of humans to change. These facts include:

1. Humans can survive only if they acquire sufficient food and other essential resources.
2. Food and other essential resources are available, not usually within the immediate grasp of each human, but rather in the larger, extended environment which surrounds the population. Each essential resource is within the grasp of at least one or a few humans.
3. It is physically possible for humans to exploit those essential resources if the humans contribute in individually specialized ways to a community-wide process which exploits those resources.

So we conclude that, for any community of humans which exists at a level higher than the hunter-gatherer initial condition, members of that community must be following, to some extent at least, rules imposed by the physical reality which surrounds the community.

1.1.17 Lesson: Rule-following behavior can appear to be stupidly biased.

Imagine that there is an observer who:

- can see the unquestioning rule-following behavior of the members of the prospering community in Figure 2, but
- can not see (or does not notice) the RP which explains the rules.

A person with such a viewpoint may feel contempt for the intellect in our prospering critter-community. Furthermore, if this person also has an agenda for what critter-society may accomplish, this person may think the rules can simply be changed to redirect the community-wide effort into this person's agenda.

Given the complexity of our human lives on Earth, I suggest it happens quite often that we humans are given a vantage in which we can recognize patterned behavior more easily than we can recognize a justifying RP in the surrounding environment.

1.1.18 Lesson: More life than before can grow, not just in the small region in Figure 1, but in the whole world.

Our first lesson above (a population can live in greater density) should of course be extended whenever we have reason to expand our view, whenever we are modeling a larger region of life. The population of LTs in the whole world can increase with discovery of cooperation-enhancing BPs.

1.1.19 Lesson: For life to continue, knowledge must evolve and grow.

Logically, each resource must be finite in size and therefore, if LTs feed from it, each resource must be exhausted sooner or later. So, for life to continue LTs must discover either a new deposit of that resource or a substitute resource, a way to live without that first resource.

1.1.20 Lesson: Rule-following behavior leads to extra wealth, in addition to the extra population density already mentioned.

Since we have noted that the critters in the cluster in Figure 2 can get their essential resources with less effort than before in the initial condition, we can build upon this to say that these critters are relatively wealthy. Their wealth generates what we might call free time. They can gather all the resources which are essential for their survival in only a fraction of their time, so they have more cycles in which they can pursue goals other than immediate resource acquisition. Among other activities, they can reproduce more.

Similarly, humans in economically-succeeding communities are wealthy compared with others who do not participate in these communities. Wealthy humans have reserves such as: food in the pantry, bank accounts, investments, networks of families or close friends, and economic opportunities not exploited. As a consequence these humans do not have to spend all their time in a struggle to get enough food to simply survive, but rather have a good fraction of free time. These humans have the option to spend more time on activities such as: procreation, exploration, and education. (For more about exploration and education, see Section 2.9 below.)

Whether deliberately exploring for resources or not, wealthy LTs may also benefit from accidental, lucky discoveries. Because wealthy LTs will be spending more of their time in non-essential activities, there will be more times when they are acting within unexplored, non-essential decision space. Consequently, the chances increase that something valuable will be accidentally discovered. Such discoveries may appear random to us humans.

1.1.21 Lesson: Randomness in selection of BPs may help life to succeed.

RPM gives us modelers a way to test a set of rules which have been proposed. We test a set of rules by running the model with those rules. But where will we get those sets of rules upon which to perform our tests? This is an open question. My human mind seems to lack any significant power to foresee the results which will emerge (in my human view) on a social scale when new rules are introduced at the scale of individual choices. Because of this weakness I usually feel stumped when challenged to propose a set of rules for individual-level choice which will lead to a desired social outcome. Perhaps other humans are more gifted in this way. But it seems we still lack a predictable way to see "down" through the interactions of RPs and BPs from the top, an imagined social-level outcome, to the bottom, a set of individual-level behavioral rules. It seems we have to fall back upon our human logic, a poor tool for making such discoveries, or upon brainstorming, which will often seem inadequate as well.

This is why I find some hope in simple randomness in choices. If the risks can be tolerated, LTs which explore randomly in the space they can reach, may discover great, as-yet-unexploited RPs.

1.1.22 Lesson: Do not expect the lessons of RPM to endorse your human worldview.

In the terms of RPM, progress may be made by any discovery of a BP which enables any living system (one or more LTs) to exploit a RP more effectively than before. One species may learn to feed itself upon another and this may be seen as progress, at least for the first species. To learn what we can from RPM we need to be open to lessons which shock our human sensibilities.

1.1.23 Digression: Our carefully specified scientific exploration evolves toward storytelling.

As we press ahead through the subsequent lessons in this Chapter the ideas that I will present become less specific and more vague. As such, I feel that I am falling into storytelling, and while storytelling I am violating my own injunction (as in Sections 1.1.7 and 1.2.2.1) to be careful about the specification of the conditions which we assume to exist at the start of each TE.

But, needing to move ahead, perhaps the best I can do is to ask you to join me in being vigilant

about the models we construct, always trying to specify models from which we may learn important lessons about our lives as humans. Each model should include at least these three canonical stipulations:

1. LTs have to eat in order to keep on living,
2. LTs can with good fortune continue to eat if they behave in patterns which enable exploitation of RPs,
3. LTs generally have no power to establish or alter the RPs from which they feed.

1.2 Second set of lessons, considering antisocial behavior

Up until now we have been discussing the good which a group of critters can get when individual critters adopt BPs which may contribute to the prosperity of all critters. Now we will consider the opposite: what happens when individuals adopt BPs which reduce the good of the group, BPs which we call antisocial.

1.2.1 Lesson: The success of some critters creates a RP for other critters.

The stage for antisocial behavior has been set by of our success in modeling pro-social behavior. The critters in the dense population in Figure 2 have become wealthy, we know. Each wealthy critter carries ample supplies of water and sugar within its body. So this region of dense population will provide good hunting grounds for other LTs which might prey upon these wealthy critters in one way or another. When we reflect upon this circumstance in terms of our overall model RPM, we see that the dense population of wealthy critters becomes a new RP on the tabletop, a RP ready to be exploited by any LTs which can discover BPs enabling that exploitation.

Exploitation of this new RP may be conducted by any species of LTs with the requisite capabilities, of course, but for now we will focus our examination on the possibility that some among our present species, critters, will turn upon other critters. We will consider two such antisocial behaviors, cannibalism and lying.

While cannibalism and lying seem profoundly different to us humans, what I have to say in this preliminary treatment about the consequences of these two BPs is mostly the same. In order to avoid redundancy in the discussion ahead I will focus first on cannibalism alone, organizing in Section 1.2.2 all the consequences which may grow from that first antisocial behavior. Then when we move on to the second antisocial behavior, lying, in Section 1.2.3 our coverage can be brief because the treatment of lying has so much in common with the treatment of cannibalism.

1.2.2 Cannibalism

For our discussion, cannibalism has these characteristics:

1. Each critter has some level of ability to kill another critter and then to eat its flesh. This ability to cannibalize will differ from critter to critter, with the result that critters vary considerably in the danger which they present to other critters.
2. A critter can decide to attempt an act of cannibalism, but whether this attempt succeeds will depend upon circumstances not entirely known by the attempting critter. We model this by saying the attempting critter faces a probability of success, a probability which depends, along with other factors, upon the critter's experience with cannibalism.
3. An attempt to cannibalize another critter, whether successful or not, incurs a metabolic cost: The attempting cannibal uses up some of its internal stores of water and sugar.
4. When an attempt succeeds, the cannibalizing critter gains the victim's internal quantities of water and sugar.
5. When an attempt fails we suppose that the intended victim survives without losing its internal stores of water and sugar.

A decision on the part of a critter to attempt cannibalism is, like all critter decisions, influenced by the economics of survival, influenced that is by the critter's envisioned costs and benefits. Each critter can sense its own abilities and thus can always judge whether it seems wise to attempt cannibalism in some present circumstance.

Even though the ability to undertake cannibalism varies continuously across the population of critters, for the sake of simplifying the following discussion we will adopt names which divide the population into two gross groupings which we will call cannibals and truckers. Cannibals will be those whose disposition to attempt cannibalism exceeds a certain threshold level. Truckers will be the others, not much tempted by cannibalism, who can be expected to undertake trades without presenting big threats to trading partners.

1.2.2.1 Digression: Keep in mind what individual critters cannot do.

Now, having specified what additional capabilities we have given to the critters to establish this new platform in our TE, you should remember what we can gain from such a careful specification of given capacities. We can gain the opposite: a definite sense of what we have not given. We need to be clear about what we have not given because we humans too easily fall into anthropomorphism in which we assume that others, including our critters, have abilities similar to those we experience as individual humans.

At this point we have not given critters any defenses against cannibalism. In particular we have not given critters any way that they can sense the degree of danger of cannibalism presented by another critter. So one critter cannot simply move away from another which presents a danger of cannibalism, because the first has no way to sense the cannibalistic abilities of the other.

1.2.2.2 Lesson: Cannibalism will probably decrease the overall population.

With the addition of cannibals to the population in Figure 2 which had been thriving by trucking alone, we now have contrasting tendencies affecting the number of critters living in that region between water and sugar. The number living there, to the extent that it is greater than in the initial condition, will depend of course upon the amount of water and sugar which can be trucked into that region. That amount would depend, we expect, upon the number of critters engaged in trucking. And the number of trucking critters will be reduced by cannibalism. So, if cannibalism becomes common enough the population in that region will diminish. The population could diminish to a level even less than that of the initial condition if cannibalism decreases the amount of foraging undertaken by the population.

1.2.2.3 Lesson: We expect successful populations to have some powers to limit antisocial behavior.

We humans are interested in the level of critter population between water and sugar because, assuming Darwinian evolution, our human makeup probably derives more from large and successful populations than from small and struggling populations. If we can succeed in modeling the individuals who comprise large and successful populations then we can increase our confidence that the models relate to our human experiences, at both individual and social levels.

While the addition of cannibalism to our model of critters at this time is a natural step in development of life, if cannibalism becomes too prevalent the consequent reduction in overall population may suggest that our modeling has gone off the most promising path. So as we continue developing this TE we will give our critters powers to limit the effects of cannibalism.

1.2.2.3.1 Lesson: Ability to recognize other individuals can help.

Thus far we have given our critters no ability to recognize one another as individuals. Such ability has not been necessary for our critters to achieve what we have shown so far. But now, with our population of critters threatened by cannibalism, we will give critters an ability to recognize other individual critters. This recognition works in the critter's sense area which we describe as arms' length around the critter's body, see Figure 4, and not at greater distance.

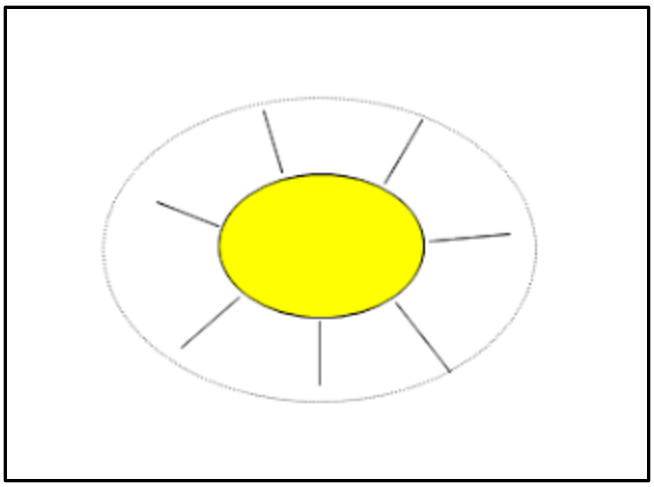

Figure 4. Showing a critter's sense area, the only area in which it can sense anything in the outside world.

This new ability combined with the critters' memory of previous experiences will help critters to make better decisions in some meetings. Suppose that on their first meeting critter A is attacked cannibalistically by critter B. If Critter B succeeds then Critter A obviously gains nothing. But if critter A is fortunate enough to survive the attack then, in any future meeting with B, A can decide to flee immediately instead of attempting to negotiate a trade.

Suppose on the other hand that on their first meeting A and B complete a peaceful and successful trade. Then in any future meetings each can recognize the other and interact with confidence.

1.2.2.3.2 Lesson: We see a natural tendency to form in-groups.

With critters thus empowered to recognize other individuals, let us focus for now on the truckers among the critters and imagine what will develop as the model runs. Some of the truckers will fall victim to the cannibals because some truckers may be compelled by threat of starvation to adopt a risky strategy of attempting trades with any strangers they meet. But, given the randomness of development on the tabletop, other truckers will be fortunate enough to accumulate mostly favorable experiences within the set of truckers, and these will be freed of the need to take risks in interacting with strange critters.

This shows a mechanism through which critters may (in the perception of a human overseer) form a sort of prospering in-group. But remember that the critters who form a prospering in-group are only focusing on moment-by-moment choices; they have no ability to perceive or conceive a group, let alone to intend to form a group. I propose that groups form in the human population in similar circumstances: by remembering our interactions with other individual humans, and by choosing to repeat interaction with those individuals with whom we had positive experiences, we form in-groups (or what may be perceived as in-groups) without ever intending such an outcome.

1.2.2.3.3 Lesson: Ability to talk about others can help.

Now suppose that we have a cluster of critters whose prosperity has come about because we have given them trade rules (instead of directional rules-from-overseer). So the critters have the primitive language enabling them to negotiate trades. We will add a few features to that language. We give critters ability to assign names to themselves and other critters, and we give them ability to exchange minimal reports about each other. Such reports will consist of two-word sentences, each sentence telling first the name of some other (third) critter and then an evaluation of that critter. The evaluation will be one of three words, good, neutral, or bad, and will summarize the speaker's experience with the named critter.

Thus we empower the critters to use what we might call reputation. In cases where two critters A and B meet, critter A, even though it has never before met critter B, may be able to decide how to act based upon reports about critter B that it has received. Now each critter can benefit from the experience of many critters. As a consequence the truckers will benefit from improved ability to prosper in trade and the cannibals will find fewer opportunities to attempt cannibalism.

1.2.2.3.4 Lesson: Recognizing external features of other individuals may help.

In the preceding we gave our critters ability to recognize and name other individual critters, but up until this point we have given our critters no additional individuality in their features which are recognizable by other critters. Now we will specify that critters do have a few external features which:

- may be recognized by other critters, albeit with variable accuracy;
- may correlate to some degree with a critter's capacity to carry out cannibalism.

So, when two critters A and B come into contact (within sense range of each other) critter A may have a feature which may suggest that A is a cannibal. Critter B may notice A's feature and B may interpret A's feature to suggest that A is dangerous.

I have said "may" repeatedly in this specification because I intend variability of all the meetings between critters on the tabletop, variability from critter to critter and from time to time. A guess made by one critter about another critter, based upon a feature of that other, might be right or wrong. But when those guesses are right, by chance, the critters so benefited may also, by chance in the long run, fall into a beneficial pattern of behavior giving rise to a prospering subset of the population, an in-group which has prospered because of its propensity to stereotype other critters based upon a feature of their appearance.

1.2.2.4 Lesson: This may be a never ending arms race.

We have gone back and forth in our TE, first threatening the prosperity of our Figure 2 group of critters by giving abilities which turn some critters into cannibals, and then helping the critters to resist cannibalism by giving some abilities to overcome the threat of cannibalism. We could continue going back and forth in an arms race of capabilities, as I hope you now see, with each

additional capability bringing us closer to a model of our experience as humans. But, with this much already completed, we will move on now to consider another antisocial capability.

1.2.3 Lying

We take up lying, which is the second antisocial behavior pattern we will consider. First we need to set the stage for this TE, and to do that we need to back up a bit. Assume that we have the prosperous and wealthy community of Figure 2, but none of either the powers of cannibalism or the powers to resist cannibalism which we discussed in Section 1.2.2 above. We perform this reset because our TE gets complicated enough when we consider the effects of one antisocial behavior at a time.

Along with the prospering population depicted by Figure 2, we assume that the prosperity has been achieved with trade rules (as described above in Section 1.1.2) and not with directional rules-from overseer. This means that our critters have the primitive language which allows them to negotiate a trade.

This existing language of trade gives us context with a convenient way to limit the complexity of this first look at lying. The ability to lie which we now bestow can occur only within the scope of negotiating a trade. A lie can take this form: One of the critters involved may promise to reciprocate but actually may have no intention to give what it promises. This critter may cheat by taking what the other has given without reciprocating.

While we stipulate that each critter has ability to lie, we further stipulate that each critter has a separate propensity to lie, a propensity which varies throughout the population. So when we first meet a critter on the tabletop, we have no way of knowing how trustworthy it may be. But once again we will simplify our discussion, as with cannibalism above, by naming only two categories of trustworthiness: we have truth tellers and liars. This dichotomy, while over-simplifying the complexity of the situation, will add useful clarity to this early consideration of a complex situation.

1.2.3.1 Lesson: Lying if too extensive will decrease the overall population.

Of course the one who has been cheated in trade will be more reluctant to try trading again in the future. If this sort of cheating becomes common enough, a critter, when facing a choice between attempting to negotiate a beneficial trade and foraging the tabletop in hunter-gatherer fashion, will choose foraging. In the extreme trade will cease and the large RP of water and sugar will no longer be exploited to support a dense population as depicted. The level of population will fall back to the level in the initial condition, and the standard of living in this diminished population will also fall back to that of hunter-gatherers in the initial condition.

1.2.3.2 Powers to moderate lying

Having thus argued that the antisocial behavior of lying could have a prosperity and population depleting effect, we turn our attention to moderating powers which we can consider giving to critters to help them overcome the negative effects of lying. We will consider the same few

moderating powers which we gave the critters to help them overcome cannibalism in Section 1.2.2 above. Since it turns out that these moderating powers produce scenarios similar to those we sketched above for cannibalism, we can pass over them briefly.

1.2.3.2.1 Lesson: Ability to recognize other individuals can help.

Given an ability to recognize other individual critters, we expect truthful critters to eventually gain an advantage over lying critters as, in marginal and perhaps small increments, liars lose ability to find other critters willing to start negotiating a trade.

1.2.3.2.2 Lesson: We expect to see formation of in-groups.

As lying critters tend to be marginalized and excluded from regular trading arrangements, we human overseers may recognize growth of what we may call “in-groups” of truthful critters.

1.2.3.2.3 Lesson: Ability to talk about others can help.

Truthful critters may gain a further advantage over lying critters when we give all critters abilities to name each other and to share reports of prior experience with each other.

1.2.3.2.4 Lesson: Recognizing external features of other individuals may help.

Truthful critters may gain yet another advantage if:

- all critters are given distinguishing features which can be recognized by other critters;
- these features may correlate with the truthfulness of the critter.

To the extent that there is any positive correlation between a particular external feature and the truthfulness of a critter, there may arise circumstances (determined by other variables in each meeting) in which critters reasonably decide to shun others with that external feature.

1.2.3.3 Lesson: The arms race continues.

If we human modelers feel some of the morality of our civilization then we may feel an objection to the point just made, being that stereotyping of individuals based upon their external appearance may be justified. Justified, that is, in terms of RPM, a model not obliged to the morality of our civilization.

An advocate for our civilization’s prohibition of such stereotyping will point out the unfairness of the stereotyping. It is unfair because some truthful critters which happen to have a distinguishing feature will be excluded, along with the liars. My response is that the advocate has just described a RP on the tabletop: Yes, among critters with the external feature there are some truthful critters eager to be given a chance to trade. So I would expect life to grow in a way that counteracts that unfairness, and I invite the advocate to illustrate such counteraction with an agent based model in RPM.

1.3 The role of groups

A natural step for us to take now in our exploration of what critters can do is to consider what may be accomplished by groups that form within the population. These groups might also be called “sub-groups” since sometimes we consider the population as a whole to be a group. See Figure 5 in which I have designated some groups by drawing red ovals around them. We might think of these groups as families, tribes, guilds, or business organizations.

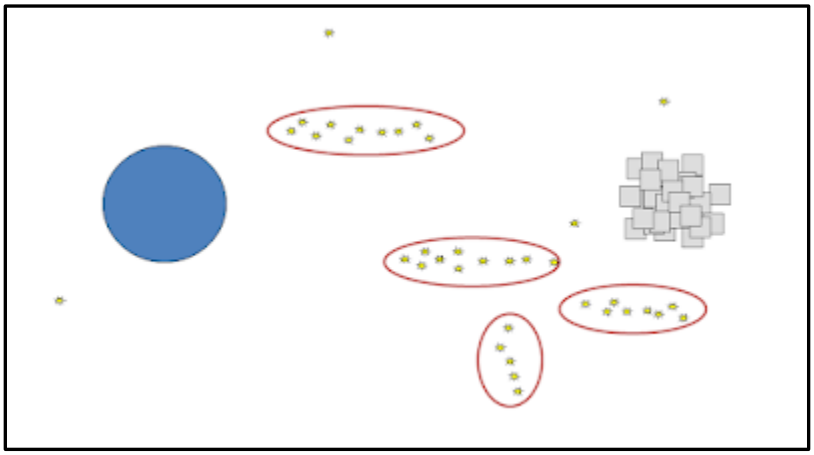

Figure 5. Critters have formed groups within the population.

For this exercise we will back up once again, this time erasing the possibility of the antisocial behaviors like cannibalism and lying introduced above in Section 1.2. But we will keep an ability which we introduced as a possible counter to those antisocial behaviors; we will keep the ability to recognize other individuals so that critters will have ability to form groups. Additionally we will suppose that critters have some inclination to organize themselves into groups, although you should remember that the critters themselves have no conception of critter-groups. We human overseers with our bigger brains conceive critters acting together in groups, so it is we humans who may learn from this TE. We suppose that many but not all of the overall population of critters act as members such groups.

For this particular exercise we will assume that each of these groups occupies a certain area on the tabletop, and that each group can carry out trades at its border with outside critters or groups, just as if the group were an individual critter. The group will be able to move as a whole at the same speed with which a critter can move across the tabletop, and can form itself into arbitrary shapes stretched this way or that, but not stretched so far as to lose internal interaction. This internal interaction, we outside observers assume, will enable the group to move as one while retaining the organizational properties of the group.

1.3.1 Lesson: Membership in groups can be beneficial.

Now see Figure 6 in which the two largest of the groups drawn in Figure 5 have moved into positions that span the gap between water and sugar. So only two mobile entities (the two groups which we recognize) were involved in finding a solution to the Figure 1 challenge of discovering

a trade route between water and sugar. Discovering the trade route would occur faster, I suppose, when fewer mobile entities are involved, because less possibilities of location and interaction need to be tested in the critters' trial-and-error way of learning.

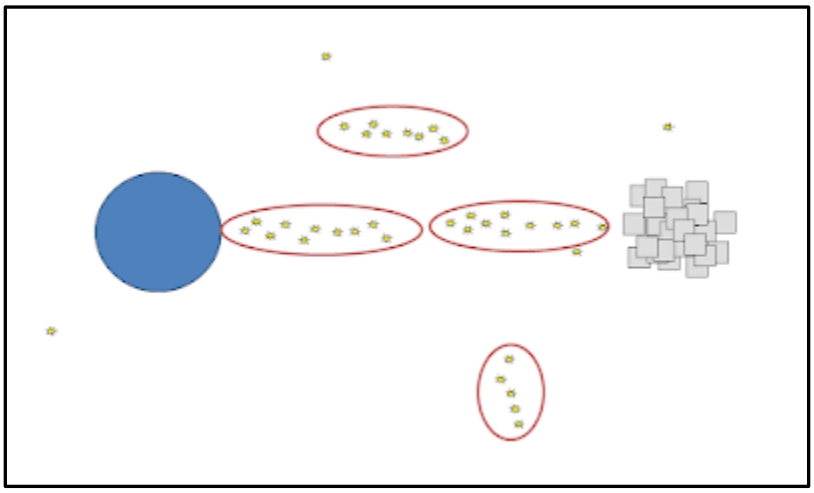

Figure 6. Two groups of critters discover collaboration to exploit the RP.

1.3.2 Lesson: Expect a tendency to form in-groups.

Wherever RPs — which are too difficult for individual critters to exploit — may be exploited by a group which is already organized for some reason, there we see a benefit in group membership. This benefit accrued to members of two of the groups in Figure 5 because those groups had formed before they discovered the trade route. But of course such group membership only helps in those cases where the BP of the group as a whole helps that group exploit a RP. It is possible that a group will do the opposite, will adopt a group-BP which makes it less likely that the group will exploit a RP. In that case an individual would be better served by avoiding group membership.

Nonetheless, with Darwinian logic, we may expect that critters may grow an inborn tendency to form groups, to be clannish. Growth of such a tendency would require the existence of large but difficult RPs. Also, such growth of clannishness would vary depending upon many other factors. Further examination of those factors could advance our understanding of human clannishness.

2. What we learn from our second challenge, in Figure 7

2.1 Introduction

Now we will move on to Figure 7 and use it as a basis for further speculation about questions of public psychology. This Figure was presented in Chapter 2, as you may recall, to picture that Chapter's second challenge for critters. We see that:

- We have zoomed out to show a larger part of the world, and rotated the view by 90° to make it fit better on the page. In our previous diagrams we had water on the left, but now we have the water on top.
- On the left a group of critters has somehow met the challenge of organizing itself to exploit the RP there on the left.
- On the right now there is another RP not yet exploited.

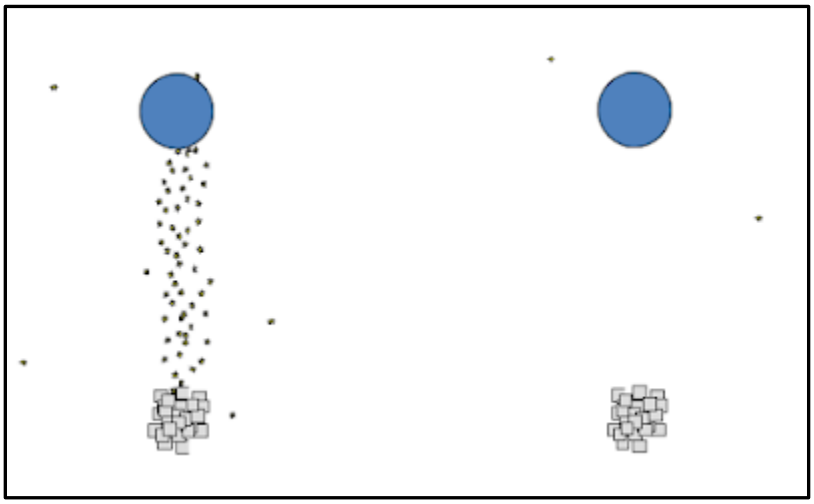

Figure 7. Critters which have met one challenge face a second, similar challenge.

With this picture we human modelers should immediately grasp the nature of the challenge offered to the critters. "The critters have done it before on the left," we say, "so they should be able to do it again on the right, and more expeditiously this time because now they have some relevant experience," we say.

2.2 Lesson: Critters can't see what we modelers see.

Remember that our critters have very limited capabilities. We start once again with critters which have only enough capabilities to achieve success of the sort which we depicted in Figure 2. These critters have only:

- the capabilities which they needed to survive as scavengers in the initial condition;
- one of the two sets of rules outlined above, either directional rules-from-overseer or trade rules.

As such these critters have no capabilities to:

- see, or to sense anything but what is within the narrow sense region around them (illustrated above in Figure 4);
- conceive that they are members of a community;
- communicate anything with each other (except, if their success on the left was achieved with trade rules, their ability to negotiate a trade);
- remember that life was a more difficult struggle before the prospering community was formed, and so to recognize that they live relatively well in their setting;
- conceptualize the RP which sustains their success;
- wonder if the RP which sustains them might be running low;
- think that their success (about which they know nothing) comes from their collective following of a set of rules.

As such, if these critters are going to achieve exploitation of the RP on the right any quicker than they achieved exploitation of the RP on the left, they are going to need some additional capabilities.

2.3 Digression: We modelers resort to more abstraction because we can't see ahead with clarity.

The critters will need extra capabilities. But, as to what those capabilities are, I admit I have not been able to imagine any carefully-specified set of capabilities which I am convinced would empower the critters to meet the challenge. The situation is too complex for me. Like in a chess game, I can't think through all the possible outcomes more than a few moves ahead. The best I can do is make suggestions as to which new capabilities I believe might help.

So once again we modelers find ourselves pressed to allow a little bit of fuzziness and anthropomorphism into our science. This echoes the discussion above in Section 1.1.23. We fall toward storytelling while remembering the rigor to which we aspire. We try not to assume too much. Our discussion in this section proceeds, we admit, with a middling degree of rigor.

2.4 Lesson: This is a challenge for a group of critters.

An early thought we should have, as we consider the challenge pictured in Figure 7, is that this is a challenge for a group of critters. Without the support of other critters there is no way that a single critter acting alone could meet this challenge. For one reason, remember a stipulation which we made back in Chapter 2 when we described the first challenge for critters (the challenge which we have pictured again in Fig. 1 above): We stipulated that no critter in its entire lifetime could travel the distance from water to sugar in that first RP (now aligned vertically on the left). So, if I maintain some pretense that my figures are drawn to scale, this stipulation means that neither could a single critter travel in its lifetime to the new RP on the right. We reason that the challenge of Figure 7 must be some kind of group endeavor. It seems the critters must develop some gifts for group-level thinking.

2.5 The moving line

To solve the critters' challenge, the first idea which presents itself in my thoughts may be expressed as pictured in Figure 8. A line of critters, long enough to span the water-to-sugar distance, departs all at one time from the established community and headed toward the vacant RP over on the right. While at first I liked this idea of mine, the idea does not hold up well under examination because it requires so many capabilities which the critters lack. To launch a moving line the existing community must possess:

- some sensation of the new, remote RP;
- a king or a headquarters which has made the decision;
- a way for a signal to pass from the headquarters to all locations along the line, telling the time of launch.

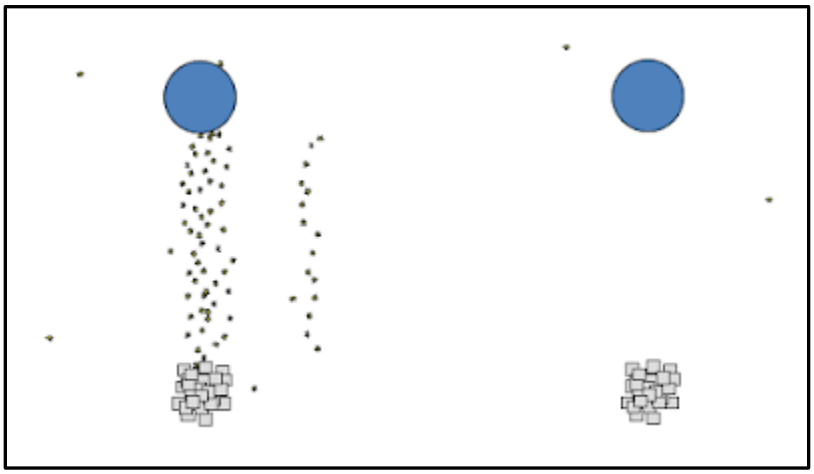

Figure 8. The moving line, an idea to meet the challenge presented in Figure 7.

2.6 Lesson: Introduction of specialists

First we must give critters abilities such as those listed above. The need for these extra abilities may be satisfied by specialization among the critters. Rather than give the needed new abilities to all of the individual critters in the prospering cluster, we can give each of the needed abilities to only one or a few of the critters, provided of course that we also give sufficient signaling abilities to all the critters whose behavior needs to be altered to conform with the plan. So we may need at least specialists with abilities to sense across the distance, make decisions for the whole group, and carry messages throughout the group.

We should remember the stipulation mentioned above, being that no critter can travel more than a relatively short distance in its entire lifetime. As the moving line starts away it must be carrying enough provisions not only for the current generation but also for some future generations who will be moving across the barren expanse. So this need to amass provisions for the venture suggests other specialties which may be needed: wealthy investors and entrepreneurs among the critters.

2.7 Lesson: The barren expanse offers some comfort.

The need to prepare carefully for the trip would be moderated, we humans imagine, when we sympathize with the history of this critter race. Remember that the ancestors of these venturing critters eked out their survival in the barren expanse such as that which these venturers must now cross. Those ancestors lived as scavengers on this expanse. So if some misfortune falls upon the mission of the whole group, the members of the group may each imagine that they could survive for a while at least in the barren expanse by scavenging as they remember/imagine their ancestors scavenged.

This imagination of an ability to survive in the wilderness has an analogue in humans. Some city dwellers of today imagine that we could survive, if need be, in the surrounding countryside by reverting to the ways of our ancestors. This imagination is probably somewhat true; a few could probably survive that way. But probably the majority of city dwellers would perish as we reasoned above in Section 1.1.6.

2.8 Lesson: Remember the difference between an overview and an internally grown view.

We have speculated on an idea, the moving line of critters as in Figure 8, for how the critters might meet the challenge we have presented to them in Figure 7. But now on reflection we should realize that the idea of a moving line grew in my human mind, and I could conceive such a thing because I have a human's overview of the critters' circumstance. Remembering that our aim in RPM is to gain a better understanding of human psychology, we should fall back to trying to find small steps that our minimal critters could take toward gaining a human-like overview, small steps that we may be reasonably expect of critters as we give them small increments of coordinative ability.

2.9 Lesson: With wealth and more free time, LTs can choose to spend some of that free time on exploratory or educational pursuits.

for critters

The critters in the prospering cluster in Figure 7 are comparatively wealthy so they could invest in exploratory pursuits — if we had given them capabilities to behave in such ways. As we consider what capabilities we may give, remember that the RP which sustains the present thriving community will one day be exhausted, because that RP is finite. So it will be reasonable from a Darwinian perspective for the critters to invest in some amount of exploration, although how much to invest will depend upon several variables. The amount that critters should invest in exploration will involve what we humans would see as an economic calculation, balancing risk with expected returns. In the long run nature will grant survival to species which choose wisely, investing in some risky exploration.

We modelers need to discover ways to help critters carry out research programs within their thinking level.

for humans
For we humans who have found more wealth than necessary for bare survival, we can and commonly do increase our expenditure for exploration of what lies in our surroundings. We also invest in education even though we are not certain that education will bring rewards.

It seems clear that most of us humans have more capabilities for exploration and education than we use most of the time. So, as with critters, we must use some sort of economic calculation, some balancing of expected risks and returns, when we decide what efforts to undertake. And, as we gain more wealth and thus more security for our short-term and mid-term survival, we typically invest more in pursuits which might uncover new knowledge about our world, knowledge which might make a difference in the long-term.

In addition to exploration and education, notice that many human activities which appear whimsical or wasteful could also produce beneficial results. Educational hobbies may lead to discovery of new RPs, or new ways to more effectively exploit the RPs we already use. I would add sports to our list of possibly-fruitful explorations, for these two reasons:

- Humans who become skilled at a particular sport may become the most valuable members of the human race in the event of an unforeseen catastrophe, a catastrophe that sweeps away all humans except those with the skills cultivated in that sport.
- Humans who master a sport or an art may unintentionally spawn networking among members of their fan base, thus creating a group which would not otherwise have existed. Such a group may bring into cooperation just the right people with just the right skills, unrelated to the sport, able to achieve some unforeseen but beneficial end. As suggested above in Section 1.3.2, groups which have already been formed for any reason may prove to be beneficial for some other reason.

2.10 Lesson: Self-justifying stories have value.

Consider Fig 9 and notice that it is the same as Figure 7, except for the centering. Now the established community lies in the center. As before an unexploited RP lies to the right, and to the left there is nothing but barren wilderness. We present this picture because it can represent uncertainty in important decisions which affect a whole group. Suppose that critters have the ability to launch a moving line as in Figure 8, but the critters have not developed any ability which enables them to know in which direction, right or left, they might discover an unexploited RP.

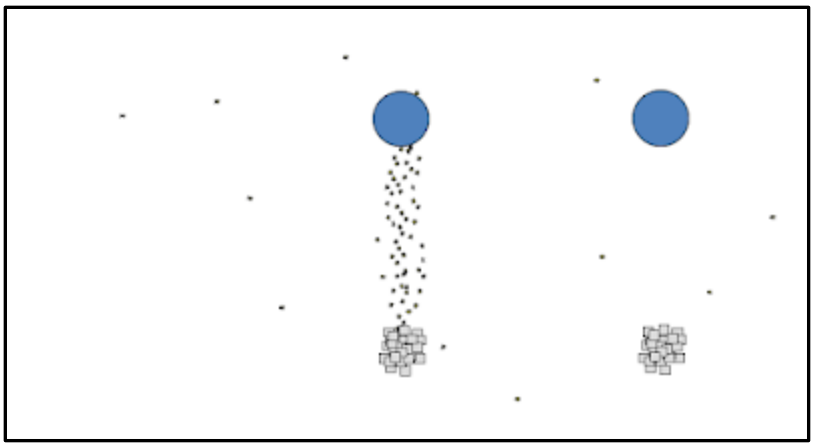

Figure 9. Which direction to explore: to the right, or to the left?

The logic of survival commands that ventures must be launched even in some cases where each venture has a only tiny chance of success. Consider, for example, how many acorns are dropped by an oak tree during its lifetime. We expect an oak tree to drop thousands of acorns, but in a steady state we expect each tree to replace itself only once. The odds against each acorn are huge.

The success of an exploratory expedition will depend, I propose, upon the commitment felt for the venture by each member of the venture. All the cells in an acorn need to do their best to support the possible life of that one acorn. All the critters in a moving line need to "believe in" and give their best for their particular venture, whether they are headed to the right or to the left. So, to the extent that the individual participants in a group venture can be motivated by individual belief in that group venture, we see (in human terms) the usefulness of their group spirit, their esprit de corps.

We humans know that a motivating story can strengthen our group spirit. We give more to a cause if we have been told, and we believe, a story which shows our group to be in the right, a story which promises reward for those of us individuals who fight valiantly through to the end. So we expect to see success more often in venturing groups which have a good motivating story.

Notice that this motivating story does not have to be true. Rather, all that this view of evolution requires of a motivating story is that the story increases the chance that a venturing group will discover a new niche. With each venturing group believing its own motivating story, a wealthy human society can spawn many venturing groups almost all of which are doomed to fail, as an oak tree can drop many acorns. Reasoning in this way I hypothesize that populations of LTs which are wealthy enough to start launching exploratory expeditions will grow a tendency to grow motivating stories, and these stories may well point away from established norms in all directions. Our human population produces motivating stories in the form of religions, national legends, and sports-team enthusiasm.

Falling back again to consider our critters in Figure 9, we probably agree that a moving-line venture launched from the center would be helped if the members of the venture believed a story motivating the venture, regardless of whether the moving line launches toward the right or the

left. But we RPM modelers who aspire to rigor know that the critters have nowhere near the storytelling and story-believing abilities of humans. All I can offer here is a call, a direction. If you believe my story about believable stories, then you can join me in this science of creating more realistic, bottom-up models of how social interactions work in circumstances which require risky, cooperative ventures.

2.11 Lesson: Cannibalism again

Before we move on from our consideration of the challenge given to critters in Figure 7, we should notice again, as we did in the introduction to Section 1.2, that so far we have considered only what we might call pro-social adaptations among critters in response to the challenge. So far we have assumed that there is a common cause among critters, that all critters will want to participate in the quest to master the challenge. But, in a more real model of the real world, we humans should recognize that our idea that critters may feel a common cause exists in our human heads, but this common cause idea does not exist in the critters' feelings, or even in their mental capabilities. In fact some critters may engage in anti-critter social behavior. Some critters may find opportunities to feed upon other critters.

The moving line, in the scenario which we imagined in Fig 8, may present an opportunity for organized caravan-raiding cannibals. In fact we should expect such a scheme to be tested in a complete model of the unfolding of life. And we can expect that such cannibalistic critters will have their own self image, their own story showing their justice and purpose in life. But for now we will leave development of this prospect for future modelers.

3. Our third challenge, in Figure 10, and Conclusion

For the final challenge which we mention in this Chapter, see Figure 10. We have zoomed out once again so we see a larger part of the critters' world. At the RP in the center critters have established themselves in a cooperative and prospering community. But now there is not just one open RP, but many open RPs. And these open RPs appear in what we humans may perceive as a pattern — a pattern of RPs waiting to be exploited by critters — if critters can obtain adequate ways of perceiving patterns in their world and guiding their actions to exploit the patterns.

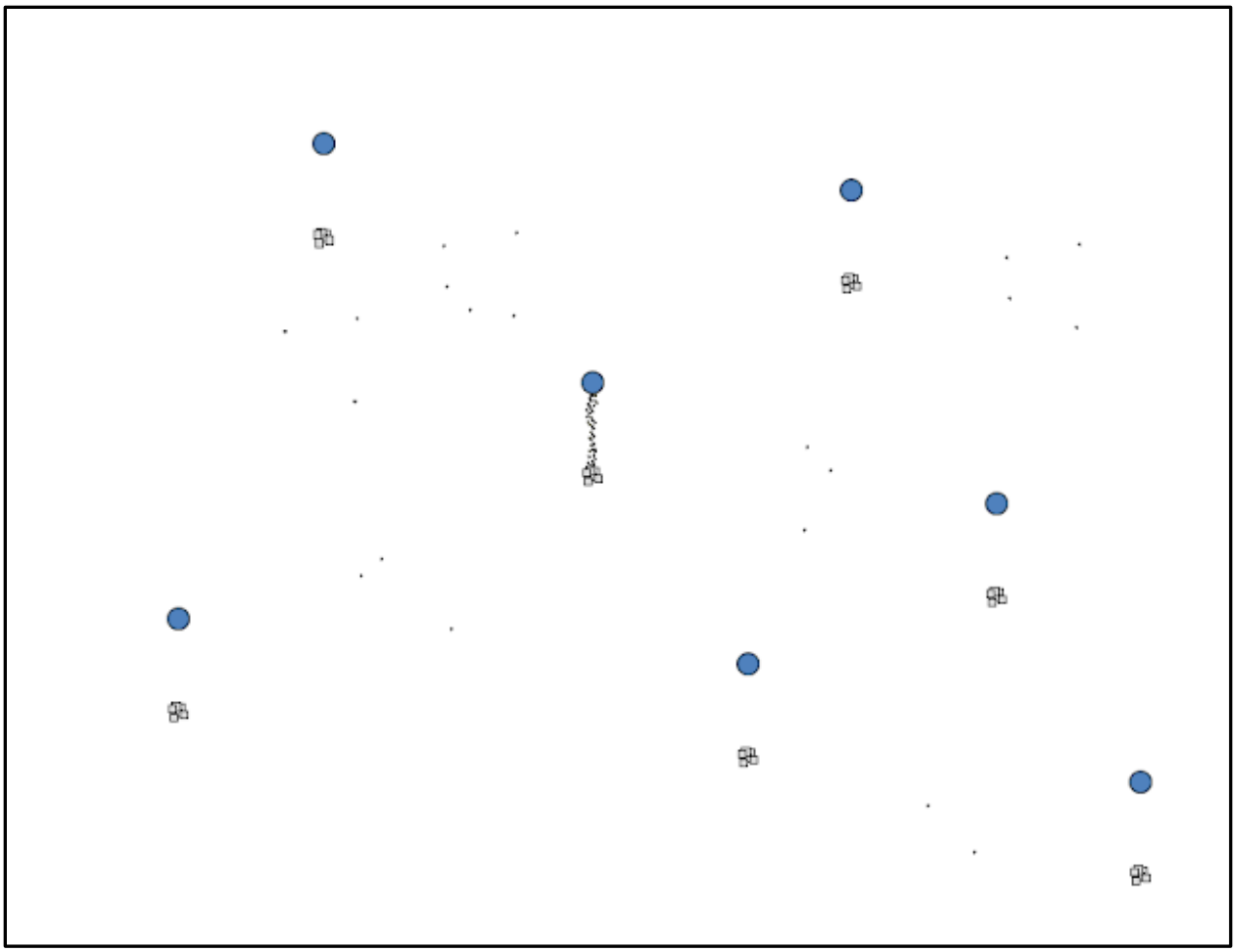

Figure 10. A greater challenge seen through a larger window onto life

In the preceding sections of this Chapter, I have already exhausted most of what I believe I can helpfully present in this first survey of issues of public psychology in RPM. So, rather than challenge myself again to write technically specific descriptions of processes which I can only vaguely imagine, I will wrap up after dangling this challenge suggested by Figure 10.

Our human cognitive abilities probably grew in a world with challenges such as we give to critters in our thought experiments. We have been using what I call Thought-Experiment Agent Based Models (TEABMs), but eventually we can learn much more as we move on into Computerized Agent Based Models (CABM). Such modeling promises to teach us much about ourselves both as individuals and as community participants.