

LETTERS

Some readers' replies to Fred Hoyle's article, "The Place of Technology in Civilization" (E&S—February).

Sirs:

Most students of social and economic history would agree with Hoyle that the role of technology is very important. Most would dissent from the exclusive dominance over human affairs which he accords to it. When he says that "technology controls civilization" few serious students would go along with him in spite of the majestic simplicity of the idea.

Hoyle's idea is very similar to the well known dogma that "the mode of production" is the dominant factor in social and economic development. As Moritz Bonn once remarked, this thesis appeals to some because it is in itself a convenient labor saving device. Armed with this cliché one does not feel the need to make the effort required really to learn something about history. One's

confidence in the mode of production hypothesis or the "technology controls civilization" hypothesis is somewhat shaken however by a historical survey; for example, a survey of the development of Australia and our own West. Could it be that the difference in outcome between these areas was largely due to the difference in ideas and purposes of seventeenth and eighteenth century migrants to America as contrasted with the ideas and purposes of the nineteenth century migrants to Australia?

One of the merits of Hoyle's article lies in the admirable candor with which he sets forth the analogy on which his thinking is based. Society, in his view, being like a collection of molecules in a gas chamber, can be studied with the aid of such intellectual tools as averaging, found appropriate to the study of mole-

cules. Is the analogy valid? Can we agree with Hoyle that it "comes close . . . to the human situation"?

It is interesting to see how Hoyle wobbles as soon as he attempts specific historical analysis. On page 13, regarding the discovery of methods of extraction and use of iron he says: "When the next important discovery was made, it did not come from civilized people at all; centuries of disturbance and fighting so befuddled the wits of civilized man that he became incapable of making further discoveries." Here he recognizes that disturbance and fighting are vitally influential. In a preceding paragraph he says that such matters "count not a jot" but at this point in the article he seems to admit that they do.

Again, on pages 13 and 14, Hoyle makes some remarks about plagues, technology and democracy during the period (say) between 400 and 1400 A. D. Both Hoyle and the historians make technology share the stage with other factors. Hoyle's sequence seems to run: plagues (at some unspecified date), scarcity of labor, followed by technological developments created to economize this scarce labor. Does this support the thesis that technology controls all? Or rather does it not conform to the widely held view that technology is an aspect of social life in which other things play a role, too?

More than technology

Hoyle's observations on "reversal of moral values" and the rebirth of democratic aspirations in the latter middle ages are certainly explained by competent historians on grounds larger than technology. Boissonnade's scholarly analysis, for example, stresses such things as the growth of political order and the development of trade and commerce in explaining democratic movements. However, Hoyle does not stick close to his technology thesis in dealing with this matter. In one place he says that the rebirth of democracy was the "product of Roman anti-democracy"—a curious reflection.

Is it true that, as Hoyle says, changes in the average per capital real income are a "measure" of the

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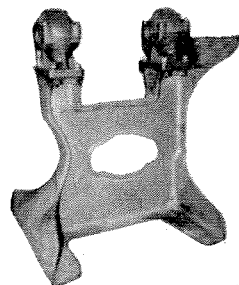
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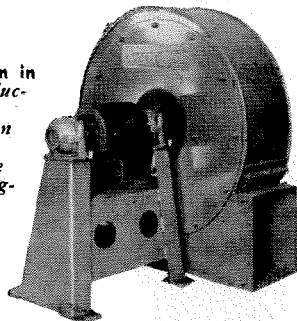
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Fred Hoyle

LETTERS . . . CONTINUED

rise and fall of civilization? What does civilization mean? Has the word been used by even the most single-minded of economic men to mean only goods and services? Is not Hoyle's view the *coup de grace* that will at last remove the arts and humanities from our sight?

How is it possible that so distinguished an astronomer presents us with meditations of this sort? An intellectual plague of our day is the use of oversimplification when trying to understand the tangled state of the contemporary political and social scene. Experiments in and out of the psychological laboratory suggest that there is a general human propensity to simplify and (in the bad sense) to rationalize events which are hastily learned and perceived in scanty detail. This suggests that it is not always wise for men of intellectual preeminence to venture too far from their own field of expertise. Plato suggests that a good citizen does well to mind his own affairs. A citizen whose business is "the starry fields of heaven" need not feel under-employed in focusing his energies upon them rather than casting a hasty glance and an even hastier formula at our troubled earth.

Walter B. Smith

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Sirs:

Mr. Fred Hoyle's article presents an imbalanced technological interpretation of history, and I would like to examine some of his arguments.

Mr. Hoyle is concerned to explain

the course of human events in terms of technological development; and not only are the significant aspects of human history presumably explained, but the only important individual or social incentive is found in technology. Mr. Hoyle argues that the other common concerns of individual men and many concerns of the community are unimportant.

Thus it is said that scientific knowledge and its expansion are the primary things that should be important to us; they determine the character of all else in our lives, and our other concerns cancel each other out. Technology determines production, which determines our average share, on the increase of which civilization rises.

This is similar to the familiar theme that the stages and characteristics of civilization are determined by the mode of production. The argument continues: if we seek a rise in civilization, what we must go after is technological knowledge (the only important concern of civilization). . . . This implies that there are other factors that motivate men and that are significant factors accounting for the rise of civilization, since they influence the growth and use of technological knowledge. But this implied content in the conclusion contradicts the premise (that technology is the only explanatory factor) from which the conclusion is presumably derived.

Mr. Hoyle's ideas could be related constructively to the thesis that no civilization and no form of social organization is guaranteed survival. Technological knowledge and other factors determine, for example, whether a democratic way of life will persist or even have any practical relevance at all. The intellectual capacity of those living in a social organization, the availability of materials for the satisfaction of even minimal needs, the ability to compromise and to maintain a spirit of magnanimity in a social context of individual variety and diversity of perspectives, hopes and ideals, temperaments, practical occupations, and needs for association are, among other factors, important determinants as to whether or not you have a democratic society.

Thus one of the factors making civilization possible is the group of practical techniques men have devised to mediate the conflict of competing interests. Civilization requires cooperation, but conflict is generated by the practical conditions under which men can bring their diverse

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and varied excellencies into a cooperative interrelationship. Participation in a particular kind of activity involves a narrowing of perspective and understanding of the needs and demands of those engaged in quite different activities. Indeed, there may be a complete lack of sympathy for those in some other activity (supporting other ends) which is as vital in maintaining the balance of our civilization as is our particular contribution.

Most simply, to do one thing prevents you from engaging in other activities, attaining other ends, especially where long training and special attention are required. Then consider the influence each activity has on its practitioners: the activity generates goals, ideals of achievement, and criteria of excellence in dedication that are always beyond what men attain, and so spurs them on while decreasing their sympathy for other activities. And so our professional pursuit (for example) narrows each of us so that we tend to

neglect other equally relevant and needed aspects of our lives (family, religion, politics, and so forth) and other relevant and necessary types of activities that go to make up the whole of civilized ways.

Competition and cooperation

Add to all this the competitive excellence of others that drives each of us further toward a narrowing of our lives. Consider also that each person is different, and so the factor of individual variety and diversity (mentioned earlier) completes a picture of the conflicting interests engendered within human cooperative association.

So we see that much of civilization depends upon the artistry of practical techniques that mediates an inevitable conflict of interests and so attains cooperative action. These techniques are cultivated through practice encouraged by example and exhortation, and they are transformed as each person gives them a

form peculiar to his personality and objectives and his trials and errors in the course of assimilation.

No man achieves this ability merely through scientific knowledge, however important science is in civilization. And in so far as a man lives in a society where these techniques are practiced, then to the degree this cooperation is realized it is also a social achievement; no man attains this by himself, no matter how intelligent he is or however much he sees the need for these techniques.

Continual cultivation, as well as eternal vigilance, is the price of liberty. And technology, as we should know these days, can be used on either side of the issue of liberty. Civilization demands many kinds of excellencies of men. The glory and achievement of civilization is not solely in that kind of human activity at which we individually happen to be proficient.

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