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Dr.K.S.Krishnan,
Director,
National Physical Laboratory,
NEW DELHI.

Sir,

Kindly find enclosed a copy of the Script
entitled THE AGE OF THE COMMON MAN / broadcast from
this station on 27:6:1959.

The Scientific Expert.

Thank you for your kind co-operation,

Yours faithfully,

C.N. Mohanram

for STATION DIRECTOR.

Encl: 1 script (5 sheets)

GOVERNMENT OF INDIA
ALL INDIA RADIO : TIRUCHIRAPALLI

THE SCIENTIFIC EXPERT

Broadcast talk from AIR, Tiruchirapalli

by Professor K.S.Krishnan, F.R.S. in the Series
"The Age of the Common Man".

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The following question has been posed for answer in a series of three broadcast talks of which this is the first. There is a preamble to the ~~first~~ question, which I shall quote first. "It has frequently been asserted" reads the preamble "that this is the age of the common man. But paradoxically enough, as Priestly has put it, the common man, if he is to be saved at all, can be saved only by the uncommon man". I may add immediately that the scientist, the philosopher, and the creative artist are ~~xxx~~ regarded by the ~~poser~~ of the question as typical examples of such ~~xxx~~ uncommon man. Now follows the question, which I am paraphrasing so that it might be in keeping with the paradoxical ^{format} ~~for that~~ of the preamble. "In trying to save the common man can these uncommon men save themselves? Can they remain sufficiently true to the high ideals of their respective disciplines?".

The scientist, the philosopher and the creative artist respectively are scheduled to ^Wanswer this question in three broadcast talks in this series. I have been invited to speak for the scientist.

There are two sentiments implicit in the posing of this question. One is the feeling that the proverbial ivory tower is at present the normal residence of these uncommon men. The second is the implicit approbation, which amounts almost to a declaration of faith that the ivory tower is the proper place to which these uncommon men should keep themselves if they are to remain true to their ideals, i.e. if they are not to lose their caste. The first relates to a factual position, namely the current practice among the scientists, whether normally they do live in an ivory tower. It is therefore not quite so important as the second which I described as amounting to a declaration of faith namely that the ivory tower is, in any case, the right place for

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them to live in.

My comment on the first is that some scientists, depending on the abstract nature of their work, may retire into the ivory tower ^{off} and on, but even they do not of course live there. If they had done that, the present age would not have become the age of the common man, as is conceded in the question. The rapid rise in the stature of the common man, which has made him what he is today, is essentially due to the enormously improved means of communication and of spread of knowledge, and the great improvement in the standard of healthy and comfortable living and his ever increasing control over nature, all of which are ~~result~~ results of the scientists' stepping out of his ivory tower.

The second sentiment which underlies the posing of the question, which I described as amounting almost to a declaration of faith, namely that the ivory tower must be the right place for our uncommon man, the creative scientist or artist, or the philosopher to live in, is a very old sentiment indeed, and has appeared in many different garbs. And it has many virtues too. It arises from a certain solicitude for the purity of all fundamental knowledge, and a certain concern lest she be found straying among the crowds in the market place.

The old Platonic ideal of "Knowledge for its own sake" or "art for its own sake" is one of the well-known forms in which the sentiment appears frequently. It is a great ideal indeed and has inspired creative thinking in almost every centre of higher learning for nearly two thousand years. "Knowledge for its own sake is intended to be distinguished from useful knowledge in the same way in which fine arts are distinguished from the useful arts or the crafts, with the obvious implication that the former are high brow and the latter are not.

The well-known toast for mathematics, "May it be no use to any body at any time!" is again an expression of the same sentiment. The great mathematician Gauss is reported to have claimed that "if mathematics were to be regarded as the Queen of

the Sciences, than arithmetic (by which he meant the ~~theory~~ theory of numbers which was his own field and to which he had made the most outstanding contributions) should be regarded as the Queen of Mathematics" and he gave the reason "because it is the least useful".

The sharp distribution that has been sought to be made between the pure sciences on one side, and the applied sciences on the other, nearly as sharp as the distinction between the Gentlemen and the Players at the Lords, is yet another form in which the same sentiment finds expression.

I wish now to make the following points on this issue, which is rather an important one.

First it would almost be impossible today for the scientist to remain long in his ivory tower, even if he wishes to. There is hardly any branch, even of abstruse mathematics, which does not find ultimately some application or other. Nearly twenty five years ago when this question was being discussed in a conference of mathematicians one of the members specially named as an example of a branch of mathematics that is least likely to find any practical application, the theorem relating to the partitioning of numbers. In naming this example he must have had in view the significant remark made by Gauss more than a century ago that the theory of ^{numbers} ~~members~~ was the least useful among the branches of mathematics, which I quoted earlier in this talk. To the surprise of the audience it turned out that this particular mathematical result relating to the partitioning of ^{numbers} ~~members~~, which was specially named as extremely unlikely to find any practical application, was actually being applied in the Bell Telephone Laboratories to the very practical problem of the ~~speci-~~ splicing of cables.

Conversely, almost every major technological advance is based ultimately on results which originally were discovered without any thought of any possible future applications.

The well-known mass energy relation of Einstein is

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another striking example: what was originally regarded as an ~~abst~~
^{abstract} ~~abstract~~ relationship, purely of academic interest, has ~~formed~~
found such violent application that it has become a matter of great
general concern. The challenge has gone round to the scientist to
step out of his ivory tower and help the common man in finding solu-
tions for some of the problems that the scientist has ~~unwritt~~
unwittingly raised.

The second point that I wish to make is this. It is
in the interests of his own discipline that the scientist steps out
of his ivory tower off and on. Though naturally technology and the
other applied sciences depend ultimately on the pure sciences for
their development, the pure sciences too are in their turn greatly
profited by the applications indeed the pure and the applied
sciences march hand in hand, and help each other's growth by a
kind of cross fertilization. At any rate they act as necessary
correctives for the defects inherent in any intensive inbreeding
that would otherwise prevail in both of them.

The development of geometry in ancient Egypt and
Greece, and of Newtonian Mechanics in Europe, and of nuclear
science in recent years, are typical examples of how the application
helps the growth of the pure sciences on which these application
are based.

Now I come to the third point apart from ~~he-d~~ the
direct advantages that ~~accue~~ accrue to his own discipline as a result of
his stepping out of his ivory tower, it is by itself a liberal
experience to the scientist, and forms part of his own education.
As I mentioned earlier, the Platonic ideal of "Knowledge for its
own sake" has been of immense value in many ways. But I should
hasten to add that by itself it is a ~~lof~~-sided one. What professor
Alfred North whitehead calls the Benedicture ideal, "of the joy
of useful work" is an equally ennobling ideal, and the two are
in many ways complementary to each other. The two ~~together~~ form
a really balanced integrated ideal, and it should be the aim of all
liberal education to conform to that integrated ideal. An experie-
nce in the technical sciences, as distinguished from the pure

sciences, doest effect a marriage of the two, a marriage of thought and action, of technique and intellectual vision. The scientist can then claim, not only to know some things well, but also to do some things well.

This leads me on to my main thesis. Namely that in attempting, in the words of Priestly, whom we quoted earlier, to save the common man, which by itself would be a very desirable thing the uncom on man saves himself, and his own discipline too.

Finally I wish just to add one more statement, before I conclude this talk. namely that the common man is not so common after all. It was the great mathamatician Lagrange who is reported to have formulated the creterion for judging good mathematics. "No mathamatics according to lagrange, "is good mathematics, unless you can explain it to the ~~fe~~ first man whom you meet in the street." I am not sure how much of the good mathamatics that we know can satisfy this stringent test. But there is a substratim of truthe underlying this statement. namely that all good mathamatics is characterised by a ee certain simplicitiy and inevitableness which make them understable ^{and} by the non-mathematician too. But even more significant is the underlying sentiment, that the man in the street, is in a ^{some} ~~hand~~ the ultimate connoiseur, and the so called common man may not be so common after all.
