

a German, transmitted and detected electric waves in space. Lodge, another Englishman, did more work on the so-called Hertzian waves. Popov, a Russian, conceived the idea that Hertzian waves might be used to transmit messages, and just over 50 years ago he transmitted and received the first wireless message in history. A few months later Marconi, an Italian, filed a patent application for the use of Hertzian waves in wireless telegraphy; and the subject passed from the scientists to the technologists.

Do you see how inevitably international science is?

A Frenchman, an Englishman, a Scot, a German, a Russian, and an Italian: all making contributions accepted by all other scientists, because they all have the same general way of thinking and the same general background of knowledge.

Logic and Method

THAT story shows the way scientific knowledge grows. One could tell the same sort of story about vitamins.

That vitamins are essential to diet was established 35 years ago by an Englishman, Hopkins. Nowadays we know the chemical formulae of some vitamins and we can even manufacture them artificially. Some of this knowledge is due to Hopkins and his colleagues, but great contributions have been made by a Hungarian (who made pure vitamin C out of red peppers); a German; a Russian; and several Americans.

How does scientific research qualify to be included in the "world mansion" of scientific knowledge?

A moment ago I spoke about the "unwritten rules" of scientific work; for science has rules, just as chess has.

These rules are based on logic and are sometimes called the scientific method; and every scientist who follows the rules finds himself in a sort of international brotherhood of men who have confidence in one another's work.

If I were to publish some startling new discovery in botany, other botanists in Europe and America do not say, "Ashby's a liar." They examine my claims quietly. They say: "Let's see what evidence he has for this discovery." Likely as not they find my evidence not completely convincing, but provided there is some evidence, provided I have followed the rules the discovery is tentatively accepted by botanists all over the world. If it stands unchallenged a few years, it even appears in the textbooks.

Code of Honesty

BUT if other botanists were to find, after years of experience, that I am never correct, and that my evidence is untrustworthy, then—without any meeting or resolution or published statement—I would find myself dropped out of the brotherhood, discredited. That is the way the international body of science keeps itself healthy.

Its members have complete confidence in each other's work, whether they are Germans or Russians or Czechs or Chinese or Australians, and it automatically throws out charlatans, quacks, and dishonest people.

A few years ago there lived a biologist who was thought to have faked some experiments on colour in salamanders, by injecting indian ink under their skins. He was discredited—even though nothing was ever really proved against him.

And just at present a Russian biologist is in the process of being discredited in the scientific journals. He took us in for years; but in the end it has been shown that he has not been following the rules; and he will never be taken seriously again, not even by his own countrymen.

It sounds almost like the discipline of a political party, doesn't it? But it is nothing of the sort. It is quite unorganised. The rules are automatically accepted: they are not prepared or passed by a committee.

There is no effective international union of scientists, and no hierarchy of authority, only a code of honesty, a common background of knowledge, a common way of thought, and a mutual confidence in one another, which binds all scientists together.

First Steps in Brotherhood

THE international solidarity of scientists is so strong that no country, however powerful, can afford long to put up barriers against the interchange of scientific knowledge, or can afford long to depart from the accepted rules of scientific research.

Under Hitler Germany tried to nationalise science and to depart from the rules: to pretend that Aryan science was different from Jewish science.

But in doing so Germany drifted out of the stream of world thought.

To-day—let us be frank—we are worried about the prospects of co-operation between the western democracies and the Soviet Union. From the press reports it seems that the Russians do not co-operate freely with the British and Americans on political matters. It is true that Russia has largely cut herself off from Western Europe. I know only too well that even her scientists are not free to travel abroad as and when they like; nor can foreign scientists visit Russia as and when they like.

But in spite of all this I do not think Russia has any intentions of withdrawing her scientists from the fellowship of world-science. Soviet scientists closely follow all the foreign scientific journals. They build their work upon what Germans, British, and Americans have done before them, and they freely acknowledge their debt to foreigners.

The Russians are so international-minded in science that they held a great festival on the 300th anniversary of the birth of the Englishman Isaac Newton, and even established Newton scholarships in his honour. They celebrated, too, the 50th anniversary of the death of Pasteur, a Frenchman. And two of the Universities have professorships of Darwinism, even though Darwin was an Englishman.

So in these days, when political conferences seem to end in petulance and disappointment, and when we talk a lot about the need for international understanding, let us remember that there is already the germ of an international brotherhood, among the very sort of men who split the atom.

And only a fool would assert that there is no hope of understanding between ourselves and Russia when there is already a very deep understanding between our scientists and Russian scientists.

I think we should make use of this understanding. It is a thin cement holding the nations together. Perhaps, among the scientists, you see the first practical step toward an International State.

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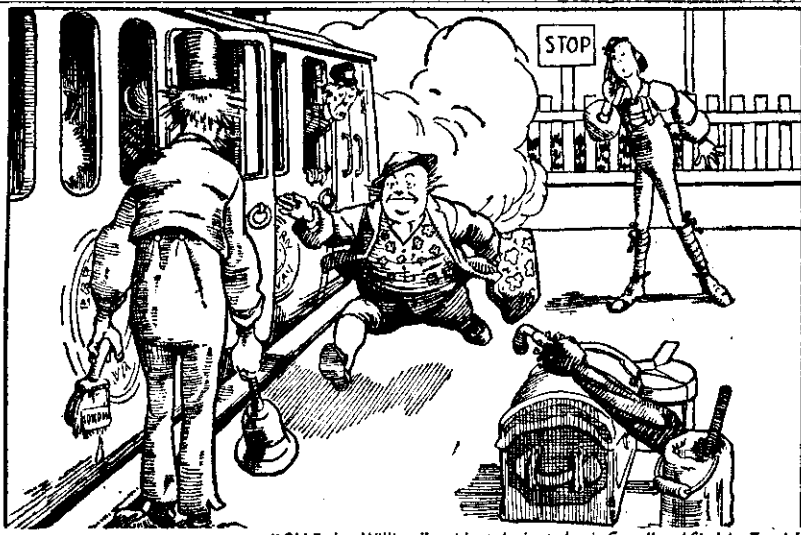
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