engineering and economic reasons. Fortunately, however, in a great majority of cases their reduction to a hygienically satisfactory level is quite feasible. In fact, it is safe to say that if funds and engineering talent were as readily available for dust suppression as a health measure as they are when it becomes a question of protecting an article in process of manufacture from injury by dust, silicosis would soon be of historical interest only.

The procedures are well known: essentially they consist in the control of dust at its sources by means of properly designed and adequately ventilated hoods and enclosures. The expenditures involved are moderately high, but not inordinately so when comparison is made with the annual costs of silicosis compensation, or with the benefits to be achieved. These benefits include, besides the safeguarding of health, many of an intangible but none the less real nature. Almost invariably the brighter and cleaner conditions which follow a serious programme of dust elimination are reflected in increased interest and efficiency on the part of the workers. Fundamentally, dust is an asset in no industry: we have yet to meet the plant manager, however resistant to the invasion of new and expensive ideas, who would assert that it was. Less, not more, dust is desirable from every point of view.

For a number of years public health authorities, insurance companies and similar bodies have been waging an active campaign aiming at the suppression of dust in industry. They have been met half-way by the more progressive sections of industry. The advocacy, in other quarters, of an opposite policy might, however, seriously retard the campaign among the laggards.

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Sept 2.

HAVING been invited to comment on the foregoing letter, I would first say that I am entirely in sympathy with its main thesis: a plea for the suppression of dangerous dusts by all known means. Unfortunately the authors' enthusiasm for dust suppression leads them to damage a perfectly sound case by overstatement. They seem, indeed, almost to imply that silicosis can be so completely and satisfactorily prevented by masks and ventilation that the investigation of its cause and cure is superfluous.

There are numerous cases, typically in mining and quarrying, where the suppression of dust to anything approaching a safe level is extremely difficult. Moreover, as the authors admit, "the reduction of dust concentrations to absolute zero is impossible", and the whole tendency of our recent work is to show that the finest fraction of active dusts, which is the most difficult to suppress, is by far the most dangerous. It is possible, therefore, that reasonably good ventilation, and still more the wearing of masks, may give a false sense of security.

In these circumstances I am unrepentantly keen to find out why dangerous dusts are dangerous. The fact that some dusts are safe, in the sense that they quite certainly do not cause silicosis even where workers are continuously subjected to relatively high concentrations, is clear proof that the dangerous dusts must differ from them in kind and possess certain chemical properties wherein their danger lies. Knowing what I know, I would cheerfully work for years in cement dust at a concentration of 10 or 20 mgm. per cubic metre, but I would not willingly work a month in flint or felspar dust of one tenth that concentration.

It seems obvious, therefore, that it is likely to be advantageous to add to a dangerous dust any material, solid, liquid or gaseous, which can be proved to eliminate or even to minimize its dangerous properties. Whether the total concentration of dust is thereby increased is a point of quite minor importance.

Our general findings in the matter of active dusts[2] have speedily been confirmed by the very interesting results recently published by certain Canadian workers[3], who have not only succeeded, where others have failed, in producing silicosis in small animals by subjecting them to freshly produced (live) dangerous dusts but also have shown that the addition of aluminium powder to these dusts makes them much less liable to produce silicosis.

While I respectfully differ from these workers in holding that much remains to be done before any definite recommendation may properly be made about preventive measures, it is, in my view, now proved that the study of the *qualitative* properties of dusts will yield valuable results, and we must be prepared, in due time, to follow without prejudice wherever the new knowledge may lead.

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Oct. 6.

[1] NATURE, **139**, 753 (May 1, 1937).
[2] Briscoe, H. V. A., Matthews, J. W., Holt, P. F., and Sanderson, P. M., *Bull. Inst. Min. and Met.*, April, 1937; June, 1937.
[3] Denny, J. J., Robson, W. D., and Irwin, D. A., *Canadian Med. Assoc. J.*, **37**, 1 (July, 1937).

Designation of "the Time-Space Continuum"

CUMBROUS language is the enemy of thought. If, as seems likely, the above quadri-verbal septapedalion vocable is to remain a centre of interest and discussion, it needs a handy name.

To this end let authorities bend their fancy and devise a crisp word symbol for the thought. Could this be on the agenda of any learned society? I doubt it. It is the normal job of mathematicians to decree that a simple symbol shall represent a complex; for they know well the advantage of this procedure. Shall the ordinary man be deprived of similar aids?

The new name would no longer need to be wedded to the indicative article 'the'. Just as we say 'time' or 'space' we would say, *not* 'the time-space continuum' but 'tispacon', or 'espatem', or whatever the name is. My own leaning is for 'spatecon'; but no matter what the word is so it be short.

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Hyperbolic Space

IN NATURE of October 9, 1937, under the heading 'Red shifts and the Distribution of the Nebulæ", there is repeated a statement of Dr. Hubble's to the effect that hyperbolic space of negative curvature