CORRESPONDENCE.

SCHOOL CERTIFICATE.

To the Editor of the *Mathematical Gazette*.

SIR,—I was very interested by the article " Reflections on the Teaching of Mathematics " by Dr. S. Weikersheimer in the February *Gazette* and in his commendation of our school certificate examination. May I put forward a view on the latter subject, speaking chiefly as a parent?

We have gone a long way in improving the syllabuses of school certificate subjects and in adapting them to modern needs, and I think that we might devote some of the energy at present spent on arranging small modifications in the syllabuses to a general overhaul of the method of awarding school certificates. Although subjects such as housecraft, music, etc., have been introduced, they are treated mainly from a theoretical standpoint (if your wife is a good cook, pianist, etc., it is 10 to 1 she can't pass these examinations) ; the result is that girls, and, to a lesser extent, boys, who could give those children who are good at algebra, Latin, etc., a good hiding at dancing, music, art, housecraft, gardening, carpentry, etc., still have to spend twice as long as these other children on the homework of the theoretical subjects in addition to having to find time to fit in the extra classes for dancing, music, etc. It is a great credit to them that they can make any showing at all in the theoretical subjects, and they are often far worthier members of society than those to whom mathematics, classics, etc., come easily.

As far as I can see, the only way out of the impasse is to give every child a school certificate on leaving school, whatever his standard. This certificate would state :

(i) The subjects passed (with pass, credit or distinction) in an examination conducted like the present one, but under a new name, and modified so as to include a wider range of tests of craftsmanship and art. I call this the " secondary school test ". When the leaving age is raised to sixteen every child should take this examination before leaving.

(ii) The child's prowess in any subject not included in the secondary school test—this would include any certificates in dancing, elocution and art awarded by national associations.

(iii) The child's prowess in sport, hobbies, etc.

(iv) The child's medical history, especially where illness or family troubles had interfered with schooling.

In order to make it possible to give this information accurately on the certificate, it would be an advantage if every child had a school report book in which the information required at the certificate stage was entered from year to year, and which could be passed from school to school, if the child moved.

The matriculation examination would then have to be absolutely separate from the secondary school test, and no certificate should be awarded on it ; it should be purely an entrance examination to the universities, though exemption from it might still be granted to children who had passed an examination like the present Higher School Certificate.

This letter may seem rather out of place in the *Mathematical Gazette*. The bearing on mathematics is this : if you would welcome changes like those envisaged above, as I would, you must consider what the effect on mathematical teaching is going to be. I suggest that it will be twofold ; first, most children up to the age of fifteen will spend less time on mathematics than at present, but they will learn what, for want of a better name, I call " practical mathematics "—they should, for instance, by fifteen be able to draw really

practical graphs much better than most school certificate candidates now ; secondly, the children, who are going in later on for subjects requiring mathematics, will, from thirteen or fourteen onwards, do more mathematics than the others, and, because they are segregated for part of the week, will make more rapid progress than at present.   Yours, etc., H. V. LOWRY.

APPROXIMATION.

To the Editor of the *Mathematical Gazette*.

SIR,—Mr. C. V. Durell wisely prefaces his chapter on approximations in his *General Arithmetic for Schools* with the maxim, " The important thing about approximate answers is that they should be right *as far as they go*."

On page iii of the Contents in the Board of Education's *Report on Curriculum and Examinations in Secondary Schools* we read : " *Note.*—The estimated gross cost of the preparation of the Appended Report (including the expenses of the witnesses and members of the Committee) is £1,735 17s. 7d., of which £280 represents the estimated cost of printing and publishing this Report."

If this figure is correct as far as it goes, it ceases to be an estimate ; if an estimate it contains false figures. No wonder there is confusion in the mind of the Fourth Former who tries to reconcile school work and the outside world.   Yours, etc., N. E. BLAKE.

A GEOMETRICAL RECREATION

To the Editor of the *Mathematical Gazette*.

SIR,—For a home-made near-mathematical recreation, consider the polyhedra whose vertices are the vertices of a given cuboid ; count the differently-shaped (*a*) polyhedra, (*b*) tetrahedra, (*c*) pairs of mirror images.

In a race to give the answers real mathematicians would, of course, be bunched together as the winners, but fumblers may have to bestir themselves to avoid the disgrace of being beaten by expert potato slicers. For this is also a practical man's problem : his saws and knife-blades make passable planes, and he has abundant material to his hand in wood or stone, soap, cheese or root vegetables for making cutable cuboids.

If the cutting be reckoned work, recreation must be sought in putting the pieces in place again. This, though undoubtedly an utterly infantile occupation, may give passing amusement to junior geometers, very childlike senior ones, some invalids, and even to a few mere doodlers.

It is not quite as easy as theoreticians may suppose. There is at least one carpenter who after cutting his block—under instruction—into six quadrectangular tetrahedra had to resort to the base device of matching his saw-cuts before he could get them rightly together again.

This is the most interesting variety of cutting. Indeed, if several cuboids of almost, but not quite, identical dimensions be so cut ; if the surfaces be given uniform appearance and the pieces mixed ; and if—the largest *if* of all —a real mathematician can be induced to play with them, it may happen that—despite knowing every coordinator from Feodorov to Plücker—he will not instantly reconstitute the cuboids. The puzzle is called " The Six Plopps Puzzle ".   Yours, etc., O. MADDEN.