If classification is a purely conventional matter, then at least it is desirable that well-established conventional usages should not be lightly discarded. In our view, however, it is more than this, and a classification that has strong geological and historical reasons in its favour should prevail over one that has not this support. There are, in fact, no other guiding principles in stratigraphical classification at present, for no rules have ever been adopted on the objective interpretation of stratigraphical names.

The reasons for retaining the Callovian in the Upper Jurassic appear to us to be at least the following: (1) the argument from usage, following Oppel[2] in the classic Jurassic area of Western Europe; (2) the fact, to which Arkell directed attention, that the Bathonian coincides with widespread marine regressions and the decline of the Middle Jurassic ammonite-families; (3) the fact that the Callovian corresponds with widespread marine transgressions and the first clear separation of Boreal from Tethyan ammonite-faunas[7].

Two recent documents[8,9] prove that Soviet geologists strongly support the retention of the Callovian in the Upper Jurassic.

In conclusion, we urge that the Callovian be retained in the Upper Jurassic until sound theoretical and practical reasons have been adduced to the contrary.

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[9] Comité stratigraphique de l'URSS, Commission sur le Jurassique. Résolutions concernant les recommandations du Colloque International du Jurassique (1962) (typescript).

THE primary object of my communication[1] was to give other interested specialists an opportunity of reconsidering the recommendations about the definition of Jurassic stages. The British Mesozoic Committee held a special general meeting on February 26, 1964, to discuss these matters. At this meeting there was disagreement as to whether the Callovian Stage should be included in the Middle or Upper Jurassic, but a small majority favoured the latter and that recommendation will be put forward at the next meeting of the international committee. It is hoped to communicate all the Committee's revised recommendations to *Nature* in the near future.

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Role of Titanium in Orthopyroxenes of the Charnockite Series

THE area (17° 37′ 30″–17° 54′ N and 83° 12′–83° 29′ E) which I have mapped[1] has revealed an important group of the charnockite series of rocks. These include charnockite (quartz, feldspar, hypersthene, magnetite rock) and garnetiferous charnockite in the acid division, and gabbro, norite, hornblende norite, biotite norite and amphibolite in the basic division. They occur mostly as sills and rarely as dykes and stocks in the khondalite (quartz, feldspar, garnet, sillimanite gneiss) and leptynite (quartz, feldspar, garnet granulite). A detailed study of the orthopyroxenes of the charnockite and the norite has revealed certain interesting features, which are reported in the present communication.

The optical data, chemical analyses and structural formulæ of orthopyroxenes are reported in Table 1.

Table 1

	A	*B*
SiO_2	51·00	47·10
Al_2O_3	2·83	4·06
Fe_2O_3	1·54	4·50
FeO	27·74	24·34
MgO	15·48	14·44
CaO	1·44	4·03
TiO_2	0·45	1·05
Na_2O	—	0·50
K_2O	0·29	—
	100·77	100·02
Refractive indices (± 0·001)		
α	1·698	1·705
β	1·708	1·716
γ	1·713	1·720
$2V$	−53° to −62°	−55° to −62° 30′
Pleochroic scheme:		
X, light pink	bright pink	
Y, colourless	light yellow	
Z, green	green	

		A	*B*
Z	Si	1·949	1·834
	Al	0·051	0·166
Y	Al	0·043	0·021
	Ti	0·014	0·030
	Fe‴	0·041	0·131
X	Fe″	0·883	0·787
	Mg	0·888	0·843
W	Ca	0·057	0·166
	Na	—	0·037
	K	0·014	—
	Z	2·000	2·000
	WXY	1·940	2·015
	Al_z	2·55	8·30

A = orthopyroxene from charnockite
B = orthophyroxene from norite

It can be seen from Table 1 that the orthopyroxene from the norite is more strongly pleochroic than the orthopyroxene of the charnockite (sections are of the same thickness). Howie[2], Turner[3] and Eskola[4] feel that the intensity of pleochroism is independent of its iron content in the mineral, while Rama Rao[5] feels that the contrary is the case. It is found that the total iron content (Fe_2O_3 + FeO) in both the pyroxenes is practically the same, but there is more TiO_2 in the orthopyroxene of the norite than that of the charnockite. Hence, the stronger pleochroism observed may not be due to iron, but may be due to the higher content of TiO_2. This is in conformity with the conclusion of Kuno[6] from an examination of orthopyroxenes from the volcanic rocks. Verhoogen[7] states that the purple or violet colour of titaniferous pyroxene is a strong indication of the presence of Ti^{+3}, most of which salts are dark violet. The trivalent titanium can be expected as a notable fraction of the total titanium present since most of the iron in the pyroxenes is in the ferrous state[8].

The orthopyroxene of the norite has higher indices of refraction than that of the charnockite. It is often pointed out that the refractive index increases with the increase of the iron content (both ferrous and ferric). But it is observed that the total iron content in both the pyroxenes is almost the same. If iron is left out Al_2O_3, TiO_2 and/or CaO may have some influence on the index of refraction. Hess[9], and Ramberg and Devore[10], respectively, considered that calcium and aluminium have no appreciable effect on the index of refraction. Hence it can be considered that the higher amounts of TiO_2 in the pyroxene of the norite may be responsible for its higher index value. Muir and Tilley[11] also observed that titanium in octahedral co-ordination in orthopyroxenes raises the refractive indices.

From the structural formulæ, it is clear that considerable amount of aluminium is present in the pyroxenes and shared by *Z* and *Y* groups. Al_z is found to be higher in proportion than Al_y in both the pyroxenes. The substi-